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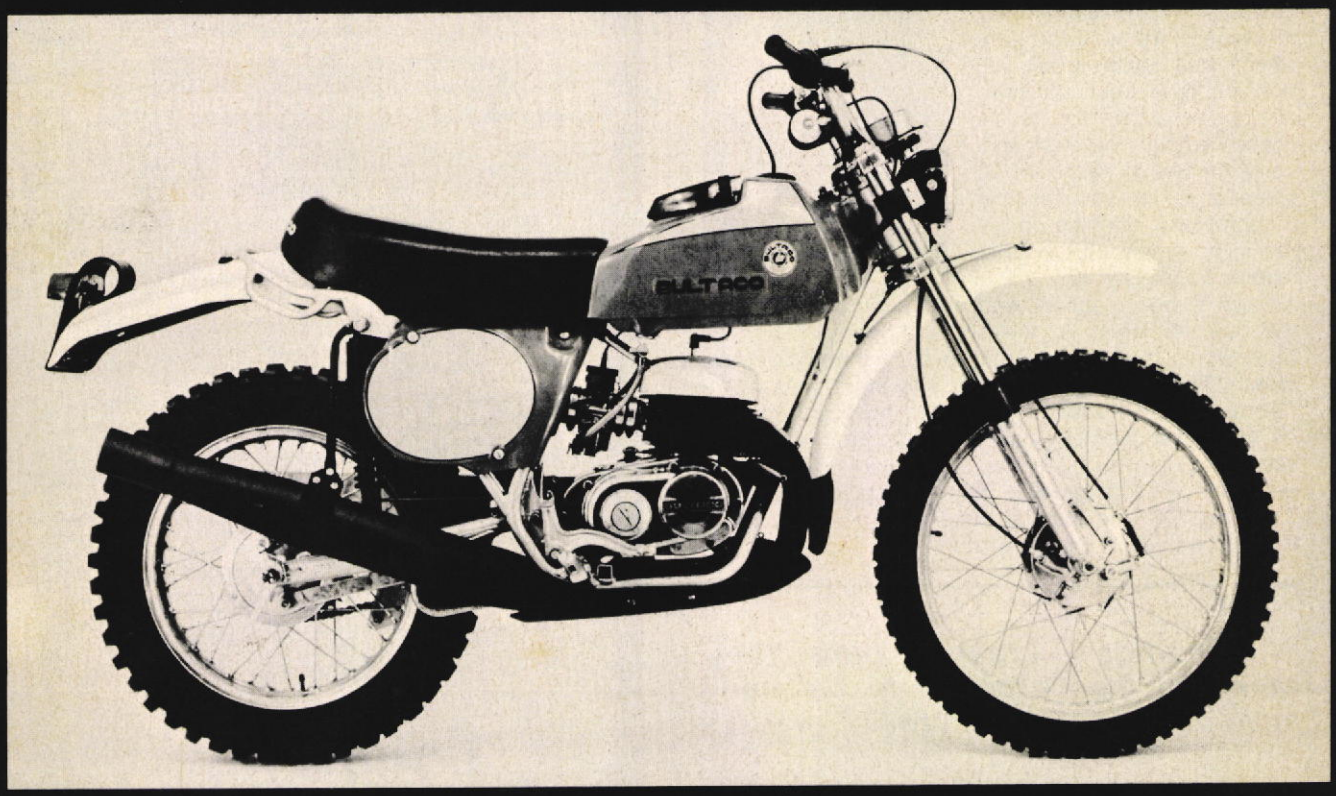

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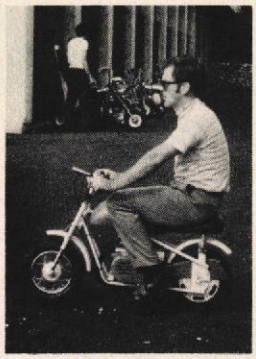

Once you've finished reading this month's issue, and digested the tests of the available automatic-transmissioned machines, we wonder just where your loyalties will lie. Will you have been converted to the ranks of those concerned with the ease and convenience of two control operation or will you become a traditionalist and line up on the side of the clutch and manual transmission?

Since it would appear that automatics are here to stay, on the street, in the dirt and, perhaps on the professional road race circuit, to deny them would be foolish. They're here, they work and there's bound to be many more of them in the near future; particularly on the street-oriented equipment. In fact, we might see a situation such as the automobile industry experienced. The automatics became so efficient that they obsoleted the manual transmission on the racetrack as well as in the showroom.

"Automatics . . . they're here, they work and there's bound to be many more of them in the future."

To be perfectly honest, we were a little skeptical the first time we were presented with an automatic to test. The very first, a Rokon some two years ago, convinced us that the concept was sound but there was still some reluctance on the part of the staff to admit that it rivaled the manual transmission in both performance and efficiency. It seemed a little crude, being a simple device that was easy to understand, but we could find no legitimate reason to rate it below the existing power delivery systems.

By the time the Moto-Guzzi appeared on the scene with a "genuine" automotive type automatic, we were ready to accept the system as a valid one. In spite of this pre-test enthusiasm, we were still amazed at the fact that our so-called sophisticated motorcycle society had not built the likes of the Guzzi-matic years before. The technology has been with us for over 30 years just waiting to be applied to a two-wheeler. Why has it taken so long to reach the riding public and why, oh why, should anyone fail to recognize that, for safety reasons if no other, we need it a lot more than the automobile driver. Automatics add a new dimension to motorcycling and are definitely here to stay. And we're glad of it.

Tony Murphy-Editor

Motorcyclist

PUBLISHED MONTHLY • NO. 934 • APRIL 1975

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cover

One of the most startling machines to come along in quite a while, the new automatic Moto-Guzzi 1000. Read the full report by Bob Greene on page 50. Photography by Bob D'Olivo

(advertisement)

THE HONDA REPORT

April, 1975 HR #16

©1975 American Honda Motor Co., Inc.

Honda Announces Trials Team for 1975 Season.

Just two years after the formation of the Team Honda Motocross group of racers, Honda has announced that it will field a trials team in America. And the men selected for the team are among the best in the country: Marland Whaley, Mark Eggar, Joe Guglielmelli and George Smith III. Bob Nickelsen will serve as coach, trainer, team activity coordinator, and as if that weren't enough, he'll keep in the action as a sometime rider (Bob is one of America's foremost trials riders). The team will be riding specially prepared Honda TL-250's. The TL-250 is the big brother of the already famous TL-125, introduced in 1973. The TL-250 promises to be a fantastic trials performer. After all, it was designed by Honda engineers and the world professor emeritus of trials riding, Sammy Miller.

AMA Names Team Honda's Rosenstiel 125 MX "Tuner of the Year."

As any professional motocross rider knows, the man who tunes his bike is an important part of winning. Team Honda tuner Jon Rosenstiel was selected by the AMA as 1975 "Tuner of the Year" in the 125cc MX category. And it's no wonder – Jon tunes for 1974 125cc AMA champ, Team Honda's Marty Smith.

Ten Out of Ten for Honda at NML Winternationals.

The third event in the recent NML Winternational MX Series was highlighted by the 125cc race, which was strictly a race of man against man. There was no question about the machine, because *all* of the top ten finishers rode Honda Elsinore™ CR-125's! The CR-125 has been nothing short of a phenomenon in motocross races across the country since it was introduced. The sweeping victory of the 125cc event at the NML Winternational meet by Honda two-strokes demonstrates the winning consistency that has built the Honda reputation for dependability and quality.

Hondaline Grows with Addition of New Goggles.

Hondaline, Honda's riding apparel division, has introduced some great new goggles. They're easy to spot, with the red, white and blue Team Honda colors on the strap. Hondaline™ goggles have open-cell polyurethane foam face linings which are both comfortable and resistant to dust penetration. There's a style to fit most any need—competition style which resists fogging, over-the-glasses style and styles for youngsters. Each pair is also packed with an extra lens. On the road or in the dirt, you'll want to be wearing these.

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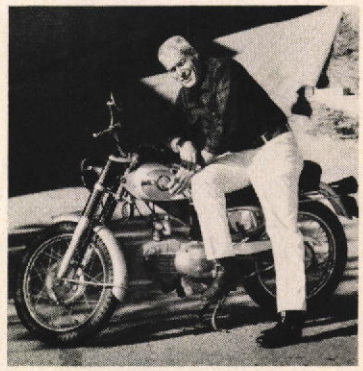

Since no one's going to build it, I'm obviously going to have to handle it myself—The Ultimate Superbike. And from here on the whole gig gets hilarious, because through the process of acceptance and rejection you've proven that your concept of The Superbike and mine are not just worlds apart but ages as well. For anyone knows that a Superbike's got to be an over-750 multi that clocks at least 125, scales between 500 and 647 pounds and sports no less than two front discs.

The 250 Benelli Super Sport—the one with the funny lay-down barrel—weighs less than half that, bumps along on only one cylinder, runs a paltry but powerful single leading shoe front drum and indicates a modest 100-per. Out front about the only things going for it are its oddity, feather weight, racer's edge handling, 80-plus miles per gallon and the novelty of being able to be centerstanded with both hands on the bars. Sounds like a real loser, eh?

As a matter of fact it really is, if popularity is measured on a cash register—so irresistible that its importers have elected to ditch it in Seventy-five, and even the machinery that begat it may be immortalized in a giant mobile in downtown Pesaro. But despite its rejection by a world that never troubled itself to get acquainted with its many virtues, I love this little Ugly Duckling that—unlike any other motorcycle I've ever ridden—always feels to have the wind at its back. Maybe that's why it's hung in there in my garage these seven years and watched the exotic stuff come and go, while all it could boast were hairy paesano cam and healthy 28mm Dellorto.

Weighing 253 pounds soppin' wet, getting 82 miles per gallon in town and running like the devil was chasing it all the while makes it unreal going in. I knew it in 1968, year of its birth, and made plans to doll the little devil up—then went to sleep on the project. Only now, at this woefully belated date, is the wee thumper's merit fully appreciated; it *will* be transformed into a sleek new image with sophisticated Marzocchi MX-style forks, dapper Ossa headlight, Camber cafe front fender and Preston Petty rear guard with integral taillight The old bread-loaf bench will give way to that keen little Suzuki 185 Enduro saddle of a few years back, and perhaps that spare Sportster peanut tank will drop right in place. Bar-to-saddle-to-peg geometry will be taken verbatim from the short-horned BMW that sleeps beside it, and even a cafe fairing may follow, if it doesn't look too hokey.

Then we can go out and romp with those fat cats in the Malibu Hills, cutting the corners tighter, braking later, and twiddling our thumbs while they top-off their drunken dinosaurs at the summit. For refuelling's only a weekly ritual with the Benelli bambino, and I get the stuff at half price, 28¢ a gallon, since twice the mileage makes it effectively half the price. And I can take the whole club to dinner every 5000 miles on the small fortune I *don't* spend on chain and tires in that period. Maintenance? *What* maintenance? Any lame can do it with one carb and points set.

Sadly, only a couple of these delightfully efficient four-stroke single roadsters remain: Ducati's 350 Desmo jewel and Guzzi's newly revamped Falcone 500. Are we going to wait until it's too late to bring them back before we wake up and raise hell? It appears their only hope of reprieve lies in the rub-off of continued unqualified success from their woods brother Honda XL and Yamaha's 500cc OHC moto-cross single speeding toward fall introduction. We shall overcome!

Bob Greene-Executive Editor

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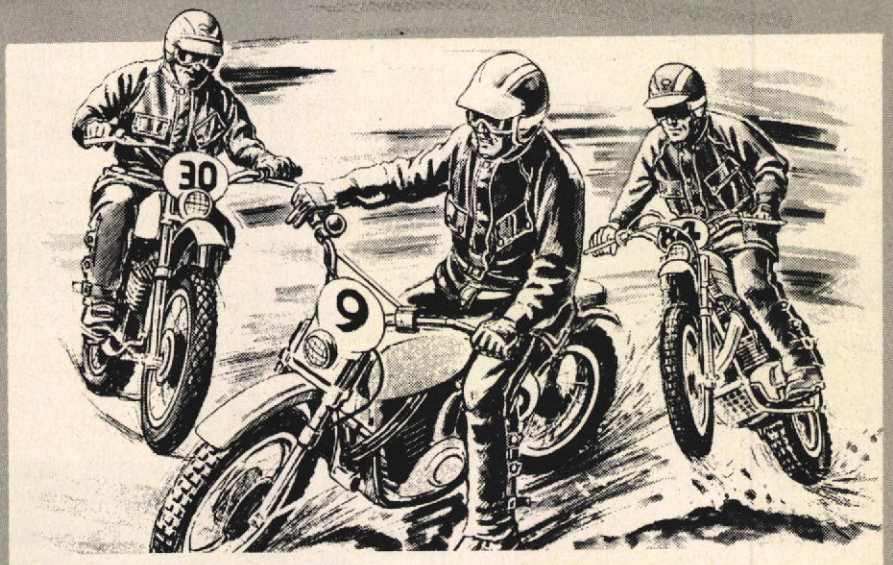

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on the line

More XL Extras

I saw the article on XL Extras in the November issue. Could you please send me information on where I can get the suspension parts? I also need a Mikuni, a manifold and an air cleaner for an XL-250. I missed last month's (October) issue and would really like to see the XL-250 Project Bike article. I would appreciate it greatly if you could send me this article. I liked your mag. I won't be missing any more issues.

Norm Usselman
Hammond, IN

The copy of the mag is on the way. As for the Mikuni and the manifold, just about all Honda shops that cater for off-road riders have a kit that makes the conversion a snap. The Red Wing suspension is handled through Marubeni America Corp., 200 Park Ave., New York, New York 10017—Ed.

You Left Out Suzuki!

I am 14 years old and very much a motorcycle enthusiast. I have been riding Suzukis ever since I was 8 years old. The reason I am writing is, I was going over your January '75 issue and came to the comparison test on the 8 dirt/street Enduro 250's. It was a very fine test except for one thing: You left out Suzuki! How come? I was very disappointed and I am sure a lot of other Suzuki fans are too. Other than that you have a superb magazine.

Mike Irvin
Kenney, IL

As Dave Ekins mentioned in his opening paragraph, "Suzuki didn't want to play this time". We can only ask the manufacturers to supply a test bike, we can't make them. Check out our March issue and see how good the 185 Suzy is. It will make your Suzuki loving eyes pop!—Ed.

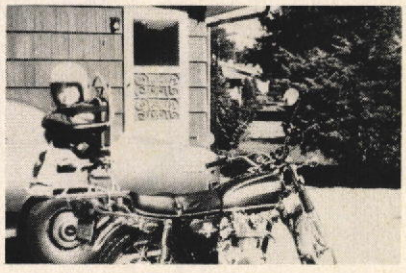
Can a Triumph Triumph

I am completely confused at this point, and I require divine guidance from the Revered Defender of British Four-Stroke Motorcycles, Bob Greene. My problem: Trend development and inflation have conspired to deny me the opportunity to buy a contemporary motorcycle. The few new machines that do attract my attention are priced even beyond the realm of fantasy; price quotations (approx. 20% higher here in Canada) simply leave me speechless (and disbelieving in a Universal Justice).

My one solution is to purchase older machines at low cost and spend the necessary money needed to restore them to as-new condition, and to my own specification. I need a touring machine and a dirt-oriented machine for leisurely back-road exploration. Until recently, one brand of motorcycle has conspicuously stood out as being the favorite of millions, proving both reliable and fast in almost every facet of the sport—namely, Triumph. Triumph Twins are readily available here, used and at reasonable cost. My idea would be to stockpile 3 or 4 machines of mid-to-late sixties vintage with the intention of building 2 single-purpose bikes of the type I've outlined. My question: Can I expect a TR6 to provide long engine life, reliable day-to-day service, and prolonged good performance? Is the TR6 capable of doing 20,000 miles on a set of valves, guides and pistons? Will the camshafts provide long life? Does the TR6 vibrate uncomfortably?

Peter Kuzyk
Ontario, Canada

You can bet your boots the Triumph TR6, properly refurbished by a competent mechanic, will prove reliable and pleasurable for 20,000 miles. It is still one of the very best handling motorcycles built to date, as well as one of the most versatile. My son's '70 model has over 8000 hard desert miles without a top-end job and runs as sharp as the day he bought it. And it has yet to leak its first drop of oil. Nor does it use it. Some sarcastic fellows hint that there's no oil in it, which makes its performance at this mileage all the more remarkable. Right?—Bob Greene



God Help Him

First, I would like to say you have a very good magazine. I believe motorcycle mags are far less biased than are car mags; and doing a darn good job of judging bikes. Second, this letter is for bike riders with a wife and child. My wife loves to ride on our bike, but since our son was born it became very difficult.

For a very simple remedy I bought a Triple A combination luggage rack, with a tall sissy bar. With four ⅜" u-bolts I bolted a regular baby car-seat to the rack and bar. The seat which we had is a Sears, but most will probably do. Two u-bolts bolt to the rack and two bolt to the sissy bar. Something highly strange would have to happen before the seat could fall off. Our son is held in with the shoulder straps from the car seat, and by the car-type seat belt that goes behind the sissy bar (another safety item). He wears a helmet (so do we) with a face shield. There is no ill effects in handling, power or gas mileage. On a trip of 100 miles we got 52 mpg. It was a steady 55 mph. Normally, by myself, I average 48 mpg around town on the Honda. I drive most of the year (down to 8-degrees above zero), and enjoy every minute of it. I also own a '71 175 Kawasaki Enduro.

Our son completely enjoys riding on the bike. He falls asleep ¼ of the time. Show him his helmet and he goes wild! (Our son started riding when he was 1½ years old.)

My motto is: The family that rides together stays together. I hope this information is helpful to other riders. It enabled me to do what I love most, and be with the people I love best. Enclosed is a picture. I hope you can print it along with my letter.

Dave Guindon
S. Chicago Hgts., IL

Dave, we don't normally plead with people in our Letters column, but we're pleading with you: Please take your son out of the hot seat. The only salvation of any motorcyclist in an accident is his freedom to be thrown clear. To be strapped to a bike going end over end is suicidal. Further, to place a 50-pound weight 4 feet above and to the rear of the axle seriously upsets the center of gravity to the extent of being dangerous. We thank you for buying our book, but we would much rather run the risk of losing a reader than a future biker.—Ed.

Premier is Premier

I am the proud owner of a Premier 125cc Enduro (1973) and I really love it. It's a helluva off-road play bike as it is, but as it happens with many riders, I want a little more out of it. I am wondering what expansion chamber would fit. I've heard that the Torque Engineering "up" pipe for the Suzuki TM-125 will fit, but I want to be sure.

If you find out I would appreciate it if you let the rest of us Premier owners know.

As for the test on the bike, Cycle World ran one in April 1974, but it wasn't the best. I'm looking forward to a better test in Motorcyclist (including a road test) in the near future.

One other bike I haven't been able to attain a test on is the H-D Sportster. It may be a legend but does that make it "hands off" to testers? Keep up the good work and stay on top.

Warren Frericks
Westwood, N.J.

Put That Knife Down!

In regard to "Two-Stroke, Ring and Coke" (Feb. '75): Harking back 20 years to my own two-stroke experience (Francis Barnett, Puch, TWN) I recall that the recommended tool for scraping the coke was a piece of copper tubing flattened at one end or even a copper penny. A screw driver was a definite "NO!". I am inclined to put your jack knife blade in

that same category. How say you?

Melba Kissell
Los Angeles, CA

I toast you, Melba. Right on! Of course, the softer scraper would be better ensurance against scratching delicate surfaces. We take this singular criticism as meaning the rest of the article is A-O-K.—Ed.

How To Road Ride

I, like many others before me no doubt, would like to extend my heartiest congratulations on a fine publication. I have followed your articles on dirt riding, and have found them most informative, but I have come to the conclusion that you should also include articles on the basic handling of street machines....road riding.

I have discovered that the majority of today's growing cycle enthusiasts on the road do not know how to ride properly. Most purchase a machine, receive a few pointers from the dealer in order to get the machine out of the shop, and they are off to learn the finer points of riding, hopefully without too many of the setbacks attributive to trial and error, which can be dangerously painful, and/or expensive, not to mention the dents to their enthusiasm.

In conclusion, I have one question which you can possibly clear up for me. What is the meaning of the term "BLUEPRINTING" when applied to an engine? Specifically, what does it involve?

Edward Brown
Far Rockaway, NY

Blueprinting is a term applied to the super-tuning of an engine without the use of any special racing or high performance bits and pieces. Mass produced engines are put together with a plus or minus factor in most critical areas and by 'blueprinting' the power plant, all clearances and tolerances are set to the exact specifications called for in the original design. The power increase can be quite startling.—Ed.

The Editorial Gap

My congratulations on your proofreading and careful road test proceedure—Re: your January issue, page 14—Mike Adams wins "the toughest enduro of the year: on a XL-250 Honda. Page 52: (same issue) "bike (XL-250) shouldn't leave the pavement".

"Enduro" is taken from the word "endurance"—meaning *to last*. You overlooked this in your test proceedure. You were not testing MX'ers. I have an XL-250 with 12,000 miles on it—currently on my second set of points, 1st chain, 3rd rear tire, and I have never taken the head off. Try that with a 2-cycle.

Bruce Armstrong
Ventura, CA

Haven't ridden any 12,000 mile enduros lately; most have been right around 100 miles long. Also hate to take 18 hp, 300 pound motorcycles off the pavement. Seems if you get 'em stuck they haven't the oats to get themselves out. And 300 pounds is a little heavy to lift.

The Mike Adams thing was my mistake. Mike has been campaigning a very special Honda MT, not his old 4-stroke XL. That tough enduro he picked off was his initial ride on the 2-stroke and he admits riding the old thumper was a lot of work. I didn't get the word about Mike's bike change until after everything went to press. Sorry.—Dave Ekins

26 Pages vs. 25 Cents vs. The Facts

I just received my first issue of Motorcyclist in he mail and quite frankly, it stinks. I don't understand how you guys can make such a cheap magazine and sell it for a buck. Let's compare Motorcyclist to any other motorcycle magazine, say Cycle. (January). Your magazine had 80 pages, Cycle 106, and then, even worse than that, you have not one color picture in it, except for the ads. (Cycle has 11 pages). And to top it all off, $1.00???

Another thing I would like to know is for your test on the RE-5. You said it had 62 hp. Cycle said it has 47 hp. Who is correct?

Kelly Werner
Bethlehem, PA

Thanks, Kelly; appreciate your unquestionably unbiased appraisal of both magazines. We feel honored to be mentioned in the same breath with Numero Uno! But wasn't it worth the extra two-bits to get the engine's actual output? Our 62 hp figure is taken from the eccentric—output—shaft while Brand C's rating was determined from the local Webco Company's chassis dyno and indicates rear sprocket output. Suzuki, by the way, has also raced several Rotaries on Webco's indoor track and come up with a variety of readings ranging from 46 to 52 horsepower. So, Kelly, you'd better keep eyeballing Motorcyclist just to be on the safe side. Pertinent facts have to be worth a quarter. As for their 26 extra pages, comparing January '75 with January '75 issues, only 8 of those "extra" pages contained editorial coverage.—Ed.

Beware The Black Shafty

I have recently purchased a 1967 Marusho 500. The motorcycle is in perfect condition and only has 6,200 miles on it. So to keep the bike in excellent condition I am interested in locating a dealer, distributor or club that could supply me with specifications and parts. I would even be interested in all overseas contacts. If you could help me in anyway with my search I would appreciate it. I would also be interested in any road tests or articles your magazine may have done on the Marusho 500.

Ernest A. Stasik
Director of Parks
and Recreation
Norristown, PA

No, Ernie hasn't been in the woods too long; there really was a Marusho, a Japanese copy of the BMW that failed to make the hit parade. Ironically, in the face of all their conquests, the only campaign that ended in defeat was this one, when they went up against the old black shafty—Ed.

continued on page 11

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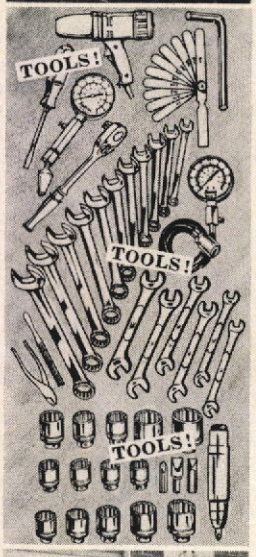

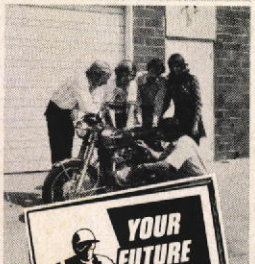

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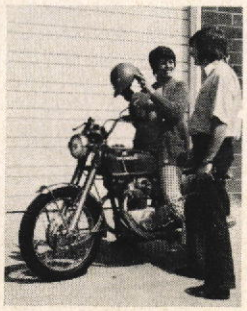

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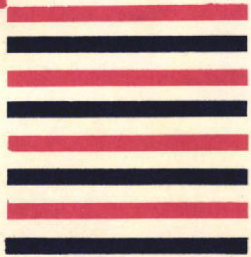

ON THE LINE *continued*

I'm a Dirty Old Man Now

First of all I wish to say your magazine is the best of the lot and I do read most other publications each month. I have also enjoyed a number of Petersen Publishing Specialty Books and manuals.

I have been a road rider for a number of years (present mount a 1972 Suzuki 750. Great bike!). This is my fourth Suzuki and since I was always pleased with them I recently purchased a TC-100 for my son. As it happens with other presents to sons from fathers, I tried it out also. Needless to say, I had a blast in the dirt.

Both my son and I have been thinking about riding in some enduro's next year and need some unbiased advice. My son intends to stick to his TC-100 at present but I have not made up my mind as to what I will purchase yet. I would like to run in the 126-200cc class. My friendly Suzuki dealer has recommended a modified TS-185 to start on.

As I am 6'4" and 215 lbs, some mods would also be considered: 1. Change to knobbies. 2. Remove all unneeded street items. 3. Change gearing. 4. Replace shocks and springs. 5. Improve front fork action. 6. My dealer will do some port work. 7. Will a reed valve help? 8. A good chamber. My main goal is just to ride and finish at present.

Ed Miller
Yukon, OK

Overlooking your vitals, although you're a giant critter, you might do well to ride the stock 185 in a couple of runs before diving off the deep end of the accessory counter. First of all, you're a greenhorn, and will be doing well to utilize what power the stocker has on tap. Secondly, you're damn near riding double all by yourself, and it is possible, if not probable, that within a couple months you'll be back trying to swindle your innocent Suzy salesman out of a 250 or bigger once you've tamed the little buggar. The point is: Be reasonably sure this is the bike for you before dropping a big load in it. If you're cocksure now, full speed ahead.—Ed.

I Go With Ago

I have just finished reading Murphy's Lore, Dec. '74, in which Mr. Murphy blasts Agostini for not competing in the second leg of the races at Ontario, California after having crashed in the first race.

I have to take exception to Mr. Murphy's opinion. Racing is not TV; it is serious, dangerous business. It is not uncommon for a competitor to be injured seriously, even terminally, unlike the sports Mr. Murphy compares racing to—baseball, basketball and football—where serious injury is rare.

Agostini is a professional. It is his business to take the risks of racing for only one reason...to win! Not to beat Kenny Roberts or entertain the spectators, as Mr. Murphy suggests. Any true race fan can appreciate this. Or perhaps Mr. Murphy is implying that the U.S. race fan is only satisfied with the blood of the competitors, a rather inhuman view of racing.

It is unfortunate that an Agostini-Roberts battle did not develop. We are all looking forward to such a match. However, until such time as Agostini and Roberts share the starting grid again, we will have to endure the luring of promotors and wait to see these two great men compare their art.

Rodger Bump
Toronto, Ontario
Canada

Right On The Ol' Roller

WOW! Finally a practical and realistic articles has been offered to the consumer regarding motorcycle chain care. Of course I am referring to your down-to-earth article THINK LINK, Stretch 'n Wear Can Ruin Your Driveline.

Mr. Greene, our firm was established to formulate, manufacture and market one product---PJ 1 chain lube. We are small but have enjoyed a respectable growth rate with this one product mostly because people such as yourself who know about chains and their care prefer PJ1.

There are more "chain lubes" on the market than there are of those funny little liver pills. Most of them were out there before we started but none of them performed well enough to impress people such as Team Honda and the myriad of other discerning folks who have investigated what a real chain lube is all about.

P. Jeff Harvey, President
Encino, California

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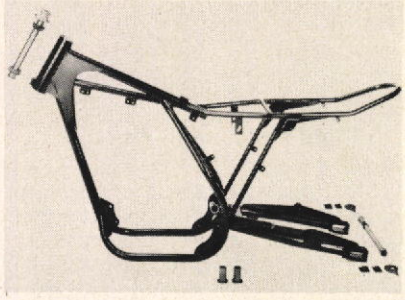
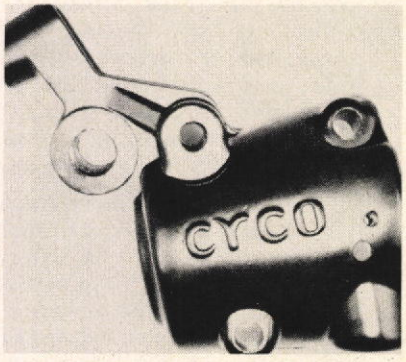
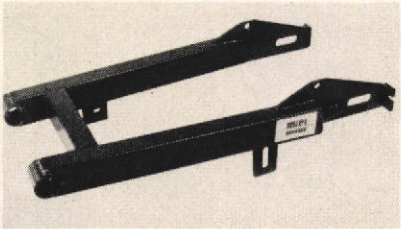


Grand Prix Cycles Distributing has just completed extensive testing on their new CZ frame. It now features forward shock mounting to give over 6" of rear wheel travel with Konis. It comes complete and all stock components will bolt right on with no drilling or modification. Available for '73 and earlier models and for '74 models from Grand Prix Cycles Distributing, 14240 East 14th St., Dept. M C, San Leandro, Calif. 94578

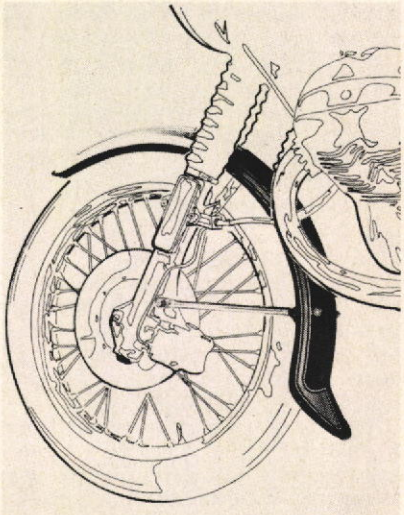


Cyco Manufacturing Co. is marketing for Hondas, a bottom mounting bracket for the clutch lever. You can now replace only the part that breaks. The bracket is directly interchangeable with original equipment and reinforced at the major stress point. Available in black or silver for only $4.75. Contact Cyco Man-



MISI is marketing a bolt-on swingarm for the Honda XR-75. Constructed of 4130 chrome moly, the arm measures one inch longer than stock but is lighter and lots stronger. Main advantage is that there is no flexing in the arm as with most stock swingarms. The result is faster cornering and more stability through the whoop-de-doos. Suggested retail price is $59.95. Order from Motorcycle Industries and Service, Inc. 2409 E. Apache, Dept. Tulsa, Oklahoma 74110

Goodyear is adding the Eagle R/T to its Eagle line of motorcycle tires. This tire is perfect for climbing a steep mountain trail or just cruising down the road. It has a specially contoured shoulder radious for gripping the road and a carcass built to take the bumps of the boondocks. The Eagle R/T is available in five sizes and ply ratings from your Goodyear dealer.



Vetter Fairing Company introduces its "Rainy Day Fender" exclusively for the BMW. It features a unique cross section design which channels the water within the fender and sends it down under the engine and away from the rider. This fender is sure to help keep the BMW rider and his bike clean. Suggested retail price is $44.00. Contact your local dealer or Vetter Fairing Company, Box 927, Dept. M C, Rantoul, Ill. 61866

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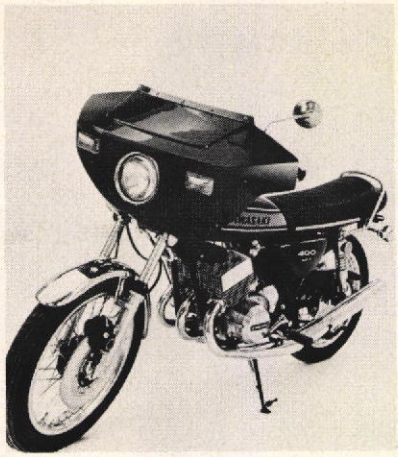
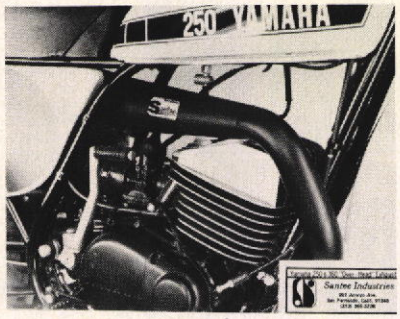


Pacifico, Incorporated is making available their latest System 2000 Fairing. Its actually two fairings in one; tough, paintable acrylic outer shell, plus an inner shell of permanently bonded fiberglass reinforced resin. It comes in black or white with mounting kits available and a choice of two windshields. Send 50¢ for their catalog containing fairings and other Pacifico accessories. Pacifico Inc., P.O. Box 348, Dept. M C, Gresham, Oregon 97030.



Santee Industries has announced the availability of its new "Over-The-Head-Style" exhaust system for Yamaha's 250cc and 360cc Enduro and motocross models. Dynomometer testing has shown astounding horsepower increases while still keeping the noise level low. Each unit comes with a silencer and a non-restricting forestry approved spark arrester, and each pipe is fully guaranteed. For details contact Santee at 651 Arroyo Avenue, Dept. M C, San Fernando, Calif. 91340

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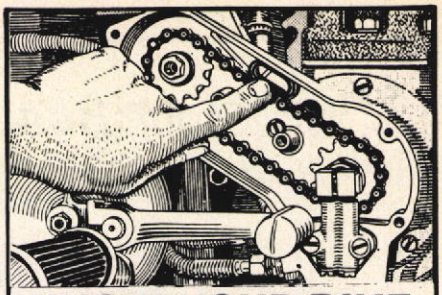

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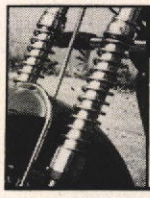

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Knobby Shop International is now making available the new Cantilever Cheney Chassis for the Honda 250/350. XL riders can now have 7½" of travel at both the front and rear axles. The chassis weighs 212 lbs. wet and features Reynolds "531" tubing, nickle plating, alloy gas tank, G.P. seat, alloy airbox, Petty fenders, downpipe, floating rear brake, alloy side panels and Cheney prepared wheels and hardware. Replicas will be available on a first come, first serve basis. For more info and a Cheney catalog contact Knobby International, P.O. Box 1592, Dept. M C, La Jolla, Calif. 92307

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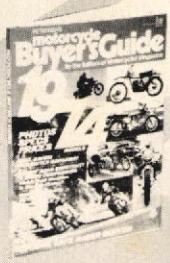

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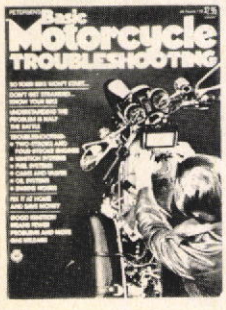

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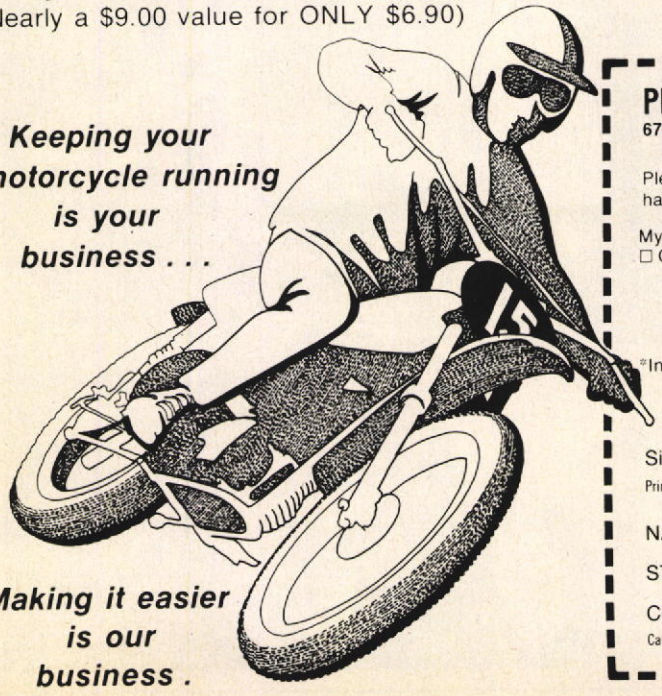

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Competition Hotline

Roberts/Hurst Split Houston Opener

Houston, Texas,—It didn't take long for reigning National Champion Kenny Roberts to make his 1975 intentions perfectly clear—he is out to repeat his Number One performance. The factory Yamaha ace romped home the victor in the TT portion of the AMA opener at the cavernous Houston Astrodome while Darryl Hurst, one of the best of the nation's short-track specialists, took that portion of the double-header.

Gary Scott, who has been hounding Roberts since their Novice days, started the season once again trying to catch the Yamaha ace. Roberts had the race to himself and Scott wisely decided to settle for a safe second place and valuable points. Mark Williams, one of the Northwest's top TT specialists, took a solid third for the Norton-Triumph concern but their main hopes were dashed two weeks before the race when likeable Mike Kidd broke his leg while cow-trailing.

While all this action was going on up front between well known names on the National Championship Trail, the real shock of the race came with a brilliant performance for the fourth spot. Young Expert rookie Dennis Briggs brought a modified Kawasaki 350 single cylinder short-tracker in fourth ahead of the cream of country's TT riders. The bike was tuned by his dad, Windy Briggs, who also happens to be one of the top men in the Kawasaki technical department.

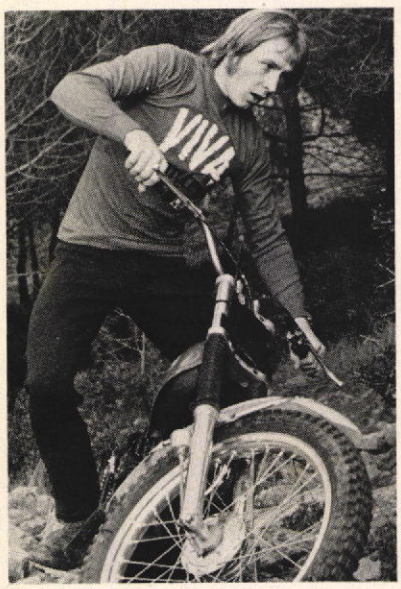
Houston native Hurst (Yamaha) had the crowd on their feet with a great ride to the short-track victory, closely followed by the Honda of Dave Hansen. Short-tracker turned road racer turned short-tracker Randy Cleek took his K&N Yamaha to third, depite the effects of a recently injured shoulder from a road race crash in Australia. Roberts was never in the hunt and had trouble making it out of his heat race. From the semi, he failed to make it to the Main but by the time the Trophy Final rolled around, he had the bike working just right and ran away with the event.

Kenny Roberts led the way home in the TT event but was out of luck in the short-track race.

Darryl Hurst slid his way to the ST win, despite the constant pressure of a horde of championship hopefuls.

RATHMELL SWITCHES TO MONTESA

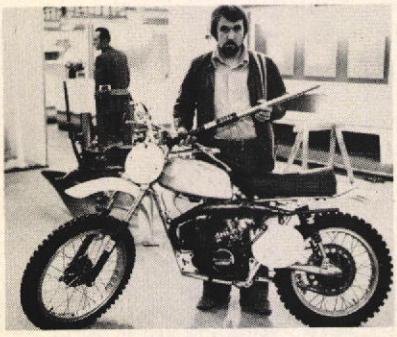
Barcelona, Spain—Trials ace Malcom Rathmell, has joined the Montesa Team for the 1975 Trials World Championship. Already winner of the 1974 series, Rathmell is also going to develop the new Co-



Rathmell had no difficulty swapping from Bultaco

ta 348 MRR (Malcom Rathmell Replica) to be released by the factory this year.

The first time out with his new machine, he won the first event for the British Championship after an incredible performance.



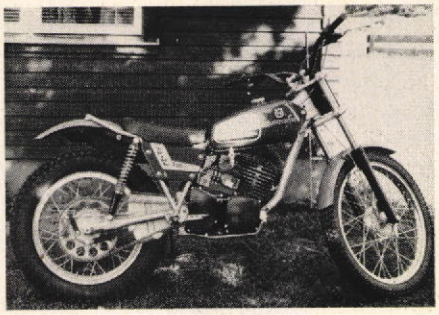
The man behind the project. Elon Windisch, with a Husqvarna fitted with his gas units front and rear.

Gas Filled Shocks From Sweden

Stockholm, Sweden—An entirely new concept in moto-cross suspension has been developed by a Swedish firm, MC Tjanst. The revolutionary 'gas-only' front and rear suspension units were invented by Mr. Elon Windisch and have proved to be lighter and stronger than conventional units.

Based on the gas spring theory, used mainly for agricultural devices, the new units have been tested by several top moto-cross riders, including factory Husqvarna ace Uno Palm. In addition to offering more travel, they are lighter and easier to work on as far as changing damping and springing characteristics.

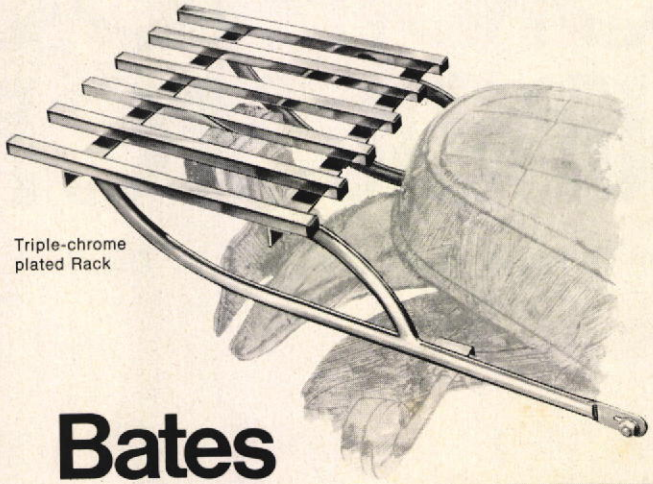
Husqvarna Trials Bike Prototype

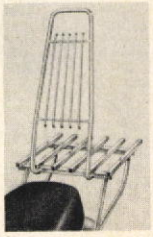


Overall lines of the Husky leave no doubt as to its use.

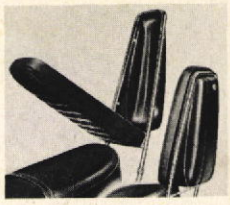
Huskvarna, Sweden—One of the most respected names in moto-cross and I.S.D.T. type events, Husqvarna, has unveiled a prototype trials bike in Sweden and if tests prove satisfactory, it will be on the market within the year.

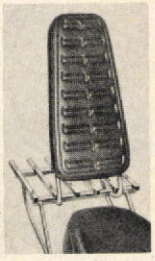
The bike is completely new from the ground up and while some of the engine castings look familiar, they are not just warmed over moto-cross components. The bike has had several impressive outings in the hands of Erland Andersson and it looks as if it is not just the Japanese who are out to garner some of the glory from the Spanish firms in the highly competitive trials world.





Bates racks up another winner.





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HONDA 400/4 SUPER SPORT

by DAVE EKINS

Straight From The Shipping Crate To The Rock Store

Wow! Look what Honda's done now. Four-into-ones, flat bars, rear-sets, even an 18-inch front wheel.

Honda calls this new motorcycle a Super Sport. They've had similar styles over a dozen years ago, calling them Super Hawks and CB92s. Seems we weren't ready for this kind of motorcycle then; we are now.

At that time Honda was trying to get a foothold in the U.S. market and anything that had a non-European look was treated like the plague. It was difficult enough just selling the 'Made In Japan' label. Since then the Giant conformed, took over the American market, and do their own trend setting.

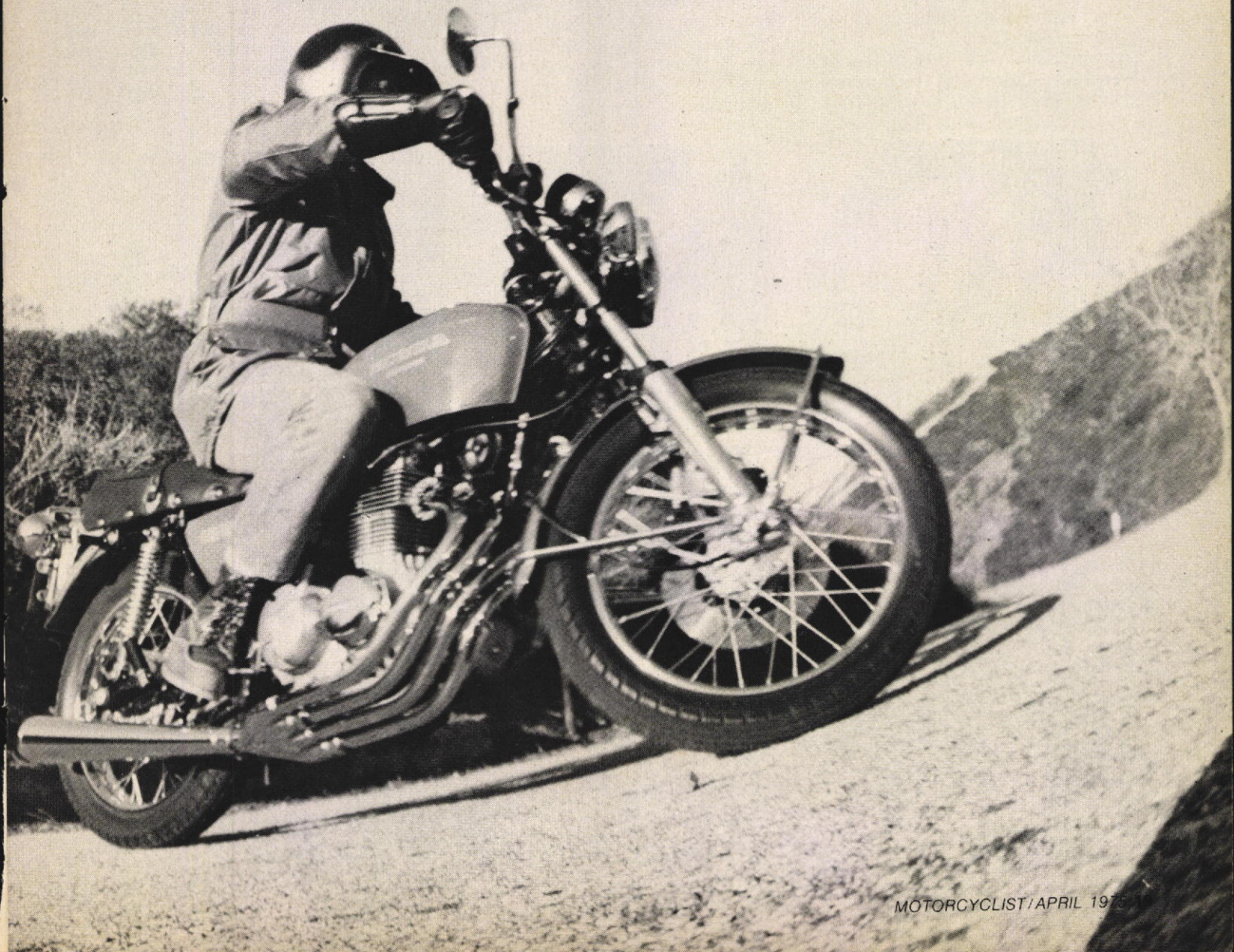
The 400 is not an effort to save the 350/4, popular as long as the price tag was less than $1000. Problem with the 350 was lack of grunt, something that just isn't there with any small displacement multi. To make it go you just keep the 350/4 spinning above the 6000 rpm mark.

The 400/4 is basically a bored-out 350; even the carburetors are the same. But we still say this is not an effort to save the tooling costs of the 350 because the 400 is the first of a new design and marketing concept that will bring us 750s, 550s, and maybe even 250's under the Super Sport logo in the not too distant future.

So what's really different? We suspect the frame is. The purpose of the 18-inch front wheel is to get the bike just a little closer to the ground. A 3.50 x 18 rear tire drops it a little closer too, which all adds up to a fairly low 31-inch saddle height.

Obviously we're dazzled by the first major manufacturer's four-into-one exhaust concept. Stubby bars, a larger-than-it-really-is gas tank, and tilt-tail seat give the Super Sport look. Rear-set footrests allow riding comfort with the short bars; something they overlooked when producing those first Super Hawks. In fact, the 400 is a face lift of last year's 350, except for a couple of other things.

The Super Sport has a close-ratio six-speed gearbox, the 350 was a five. Punching the 350 bore from 47mm to 51mm enlarged the engine to 408cc. It also took the compression ratio up from 9.3 to 9.4:1. Honda claims this added displacement, plus the exhaust system, gives the bike more torque; in



HONDA 400/4 SUPER SPORT

the lower rpm range it feels about like the old 500/4's. We found it to actually pull from 20 mph in 6th gear without chain snatch or hesitation. Power comes in around 5500-6000 on the tach. There is a slight vibration felt at handgrips and footrests from 4500-5500 rpm. Unfortunately that puts you right at the legal 55 mph bracket in top gear.

A close look at the actual internal gear ratios reveal 6th to be a step taller than the 350's 5th. Bottom gear for both are the same. The actual differences are in 2nd, 3rd, and 4th.

Internal Gear Ratios

350/4		400/4
2.733	1st	2.733
1.850	2nd	1.800
1.416	3rd	1.375
1.148	4th	1.111
.965	5th	.965
	6th	.866

Primary reduction ratio for both engines is 3.423 and the final drive is also the same at 2.235, making the overall ratios in 1st and 5th identical.

At a claimed dry weight of 441 pounds the 400 engine is just 2 pounds heavier than the 350; you could say the price of the extra gear. The rest of the four is contemporary Honda practice; plain rod and crank bearings, transmission shafts in ball and roller bearings with power from crank to clutch via Hy-vo silent chain. The single camshaft is also chain driven, actuating rocker arms in an otherwise 350/4 cylinder head; we suspect there are chamfers in the squish to make room for the bigger bore.

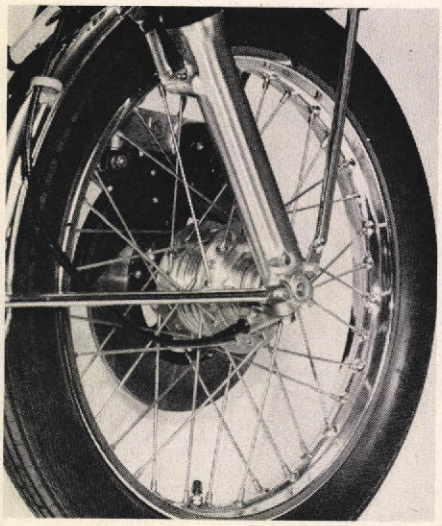
The Honda hop-up guys, Action Fours and Yoshimura Racing, sadly shake their heads and mutter something about the valve angle being wrong, making it useless to try to increase valve lift. Yoshimura does offer a mild cam with a minimum of lift and increased overlap but they can't do the wild things they would like without casting up a whole new cylinder head. So the 400/4 will escape the racer's wrench, probably a plan pre-conceived on Honda's computer.

All oil is carried in a deep finned cast aluminum pan beneath the engine. 3.7 quarts of it is circulated not only through the engine but forced into the transmission also. The owner's manual tells you coasting the bike with the engine shut off for any distance could cause some gearbox damage since the gears are only properly lubricated when the engine is running. Anyway, don't coast the bike; dead engine downhill racing is a no-no.

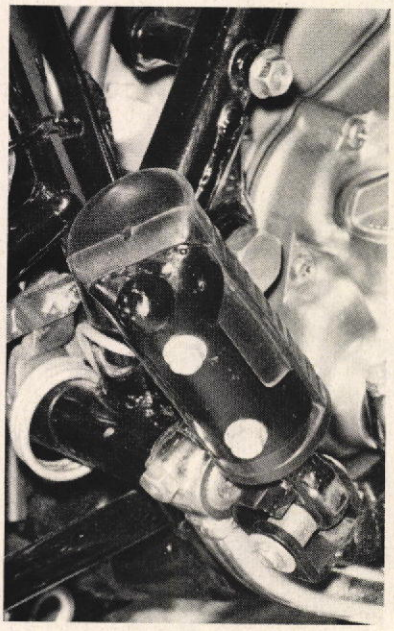
We found the Super Sport to be attractive with its simple red on black color scheme. Chrome fenders and exhaust system add richness to the sleek bike. Front forks show us a pair of bare hard chrome stanchion tubes and aluminum alloy sliders topped with neoprene wipers, moto-cross style.

A single 10.25 inch diameter disc with a single action hydraulic caliper brakes the front wheel. You might assume Honda would have at least left casting lugs on the opposite fork slider for an additional caliper mount; they didn't. The rear wheel is from the 350, the brake too. If this were a two-stroke, the SLS rear drum brake would be too small, but it's not and compression braking adds greatly to the bike's effective stopping distance.

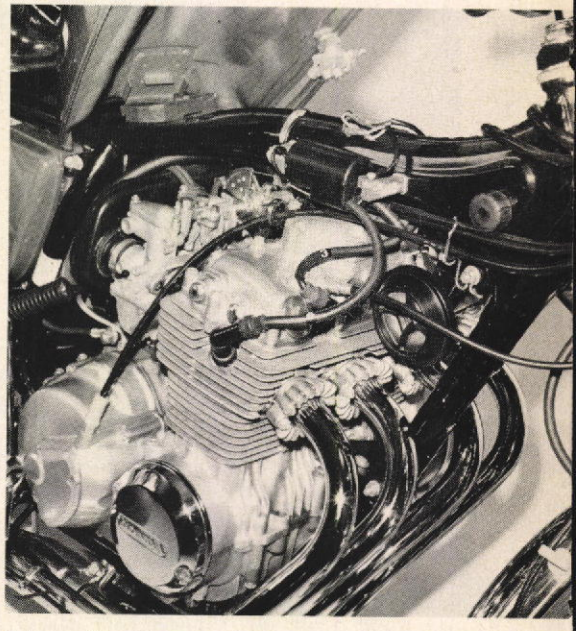
The rear shocks are typical Honda (Japanese Industry) almost-work jobs, and the forks do work satisfactorily. Honda's 550's and 750's have what they call "Free Valve" fork action; the 400/4 has this device too. When bringing the bike to a stop there is an audible click from what sounds to be the caliper linkage just as the bike stops and the forks begin their return motion. The link pin is suspect, but could it be the free valve?



Fork leg is not equipped for disc on this side; speedo drive would probably interfere anyway. Black shroud over disc acts as a fender.



R/H footrest must fold to clear kick start lever. Steel plate on underside of peg has metal ball to grind



Spine portion of frame consists of welded-up steel stampings. Both high tension coils have two leads firing a pair of plugs at a time.

Honda couldn't give us an answer.

Seems like we're knit-picking, but when you've got a bike this finely made, and expensive, little things become more critical. It has two basic faults; one is the passenger pegs mounted on the swing arm. This means every time the wheel moves over a bump the passenger's legs move too. We can forgive Honda for this because it is basically a solo machine.

The other problem that came about is not entirely Honda's fault either. We can pin this one on the '75 Lights On regulations. During our photo sessions we do a lot of stop and go, never any extended riding. We used the battery a bunch in the studio getting some fancy photos and eventually ran it clear down to a weak beep from the horn. The 400/4 kickstarted—the right footrest folds up for this purpose—and we motored around for several miles in the city but the lights were pulling off so much juice the battery didn't come up enough to electric-start the bike. In desperation we unplugged the headlight, took out both front turning indicator light bulbs, and rode several more miles. That did it; it electric started and the battery sounded strong.

The problem that may arise will come from the guy who stops the engine with the kill button. After dark the headlight will still be glowing, so he will pull the key. Daylight hours may be a different story, and five minutes of idle conversation with the engine off and lights on will pretty much drain the battery. The only salvation is to either push or kick-start the bike. The slow recharging process will be a problem. The manual simply tells us the thing doesn't charge while running at less than 2000 rpm. Knowing Honda the way we do, you can bet they'll have this little item fixed in one big hurry.

Honda's rear view mirrors have a problem too. They are not wide enough to see what's going on behind without moving your body to one side or the other. We made a size reference to the fuel tank; visually I'd say it holds in the area of 5 gallons. Actually the tunnel takes up enough area to limit the fuel capacity to 3.7 U.S. gallons. That's about 100 miles, with another 40 in reserve.

What did we like? The ignition key near the speedo-tach where it belongs. And it being a combination switch and fork lock, the latter borrowed from the Italian Guzzi. Riding position is fair and handling very good. We liked the gearbox and the engine and all its useable combinations, but would prefer a faster turning throttle so you can turn from off to full-on with one motion.

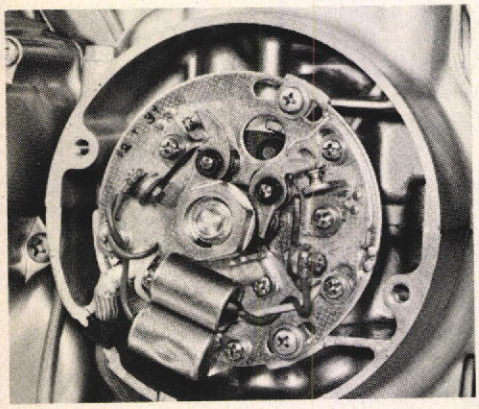
We kept tabs on fuel used during a lot of heavy-throttle in-city riding and came up with a 41.6 mpg figure. However, conservative riding should stretch that to a more acceptable figure.

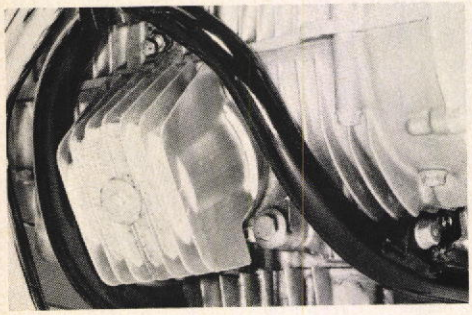
There are a few '75 innovations we liked besides the relocation of the switch. When the choke is in use, the bike runs at a fast idle so you needn't have your hand on the throttle to warm it up. In conformance to some future regulations the engine breather hose vents into the air inlet housing instead of atmosphere. There's a rubber block attached to the end of the side stand that's supposed to cause it to fold up if you happen to ride off with it still extended; we didn't try the gimmick but it should work. And finally, we liked the fuel shut-off. Down is on, up is reserve, and horizontal is off. You don't have to look down anymore when turning to reserve for fear of selecting off.

All the switches and controls are at your finger and toe tips. Everything works as smooth as a hot knife through butter, and the bike is narrow enough to slip through dense traffic—a decongestion bike.

It's light, maneuverable and silent. That's the best part; it's so quiet all you hear is the gentle whine of the gears, changing pitch as you shift from one to the other. Inlet and exhaust noise is almost non-existent. This is the coming of a new kind of motorcycle, fast, silent, and fun.

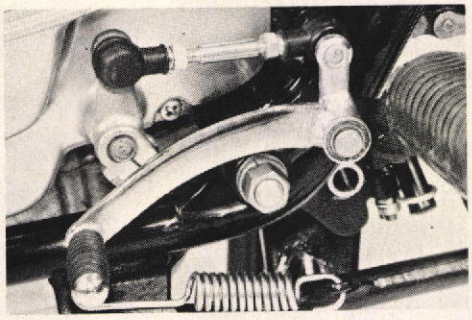
continued on page 74

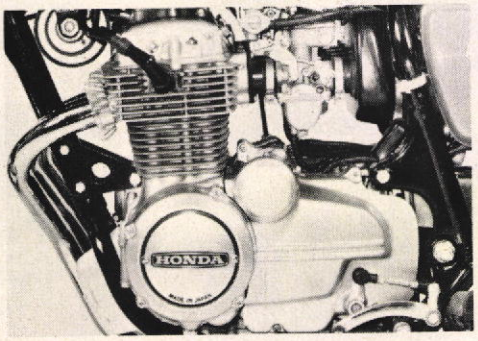




The 400/4 has two separate ignitions, points, condensers, and coils. Left-hand set fires 1&4, right set, 2&3.

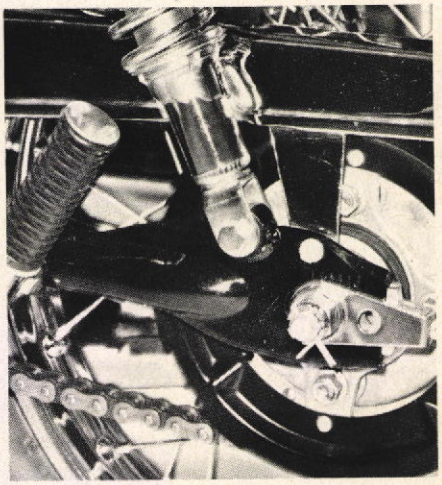
Lower portion of frame allows ample working clearance for oil filter prior to joining single downtube.





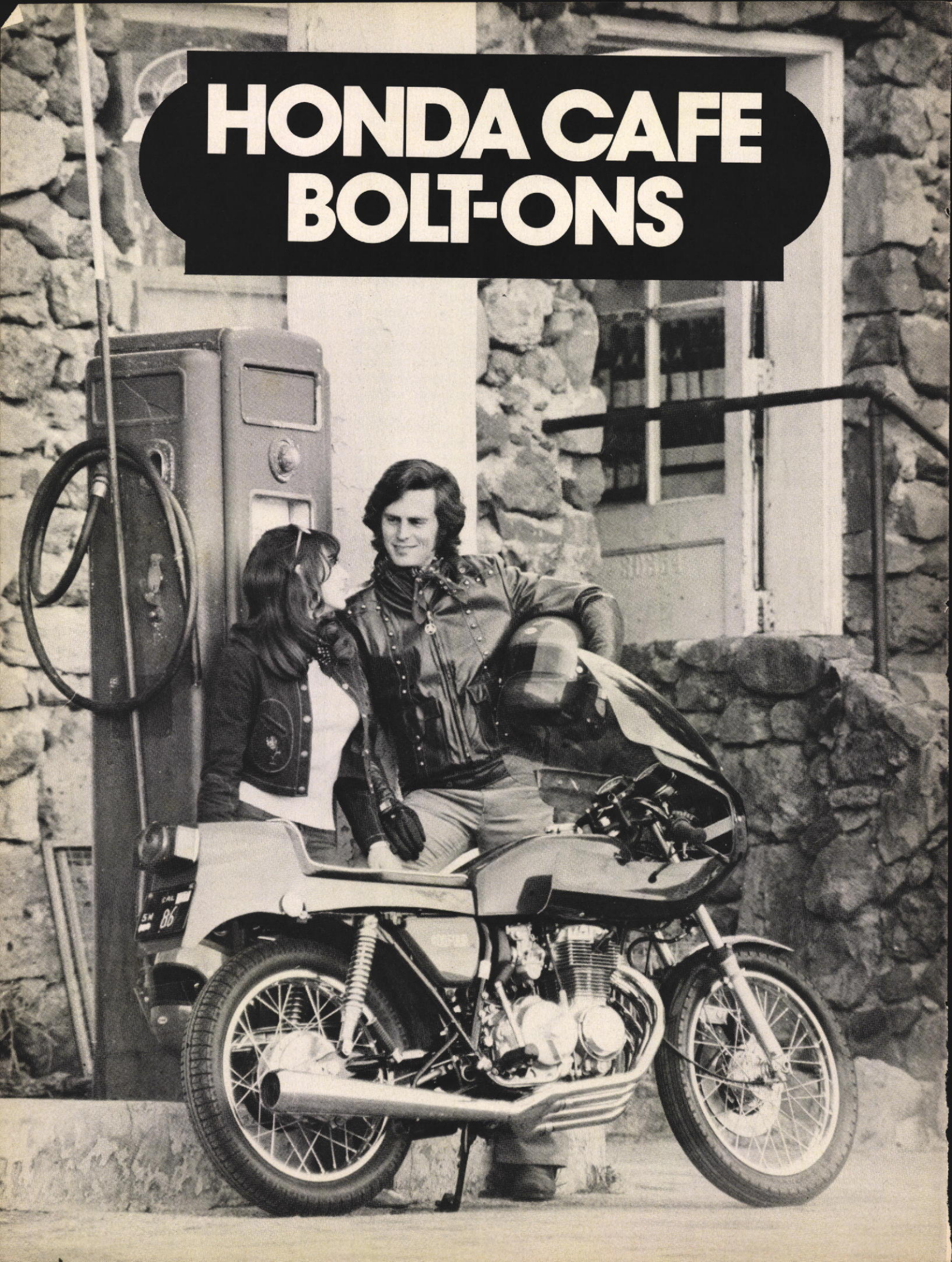
Rear-set footrests require a little additional linkage between shifter and shaft. Rubber caps prevent crud from creeping into ball joints.

Essentially it's a 350 Honda four bored out to 408cc. A 6-speed gear cluster, replacing the 350's 5, and new exhaust system make the differance.



Disc around sprocket is another Honda innovation for directing cast-off chain lubricants into chain guard instead of onto rider.

HONDA CAFE BOLT-ONS



Motorcyclist + Racer 1 + Honda 400/4 = Cafe Racer

by Dave Ekins

This cafe thing all started in England many years ago when bikes were inexpensive, plentiful, and much of the Island's populace rode them. The name is the intent; they would race around town after hours from cafe to cafe. Of course there would be a whole lot of friendly dicing which eventually led to the bikes looking more and more like road racers with lights.

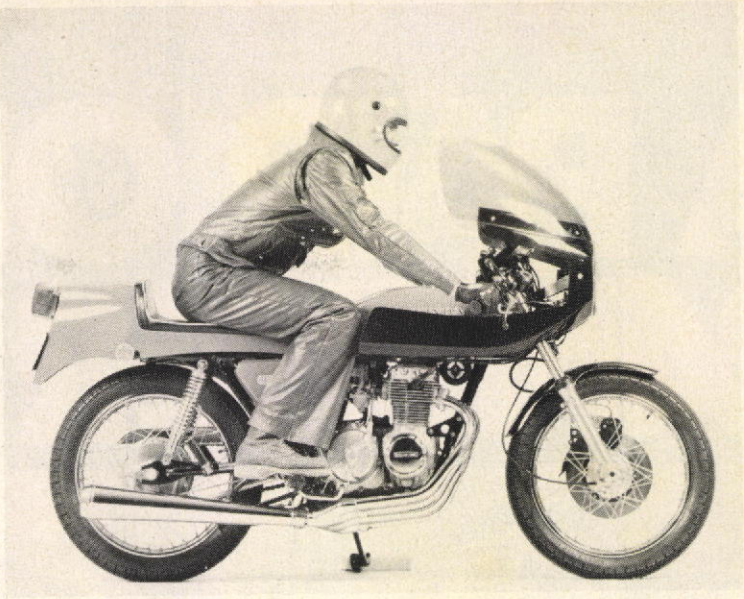
Clip-on bars, lower seats, rear sets, and fairings became standard gear of the coffee bikes. It also created an after market for cafe accessories and gave people like Paul Dunstall a whole new line of product to make.

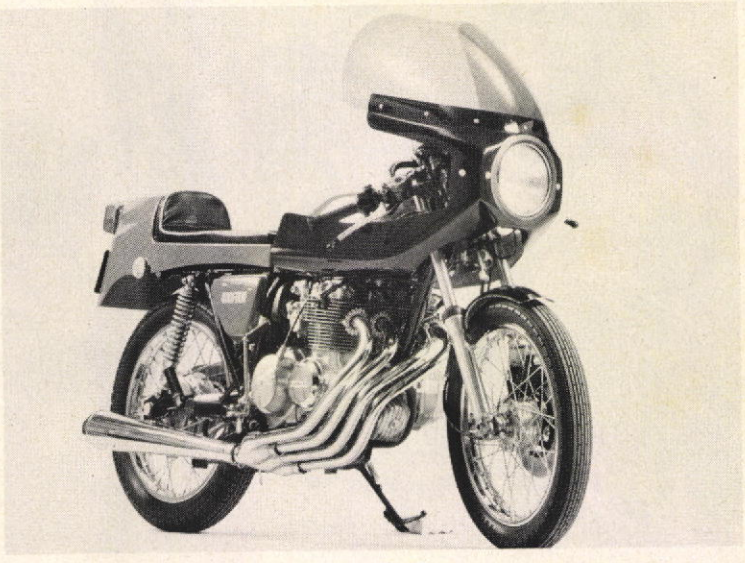
Currently there's several firms in the U.S. engaged in manufacturing cafe racer product. Seats and tanks, singularly or in combination are big. Clip-ons and drop bars are plentiful along with rear-set footrests. There's got to be a dozen front fenders in the offering and fairings too numerous to count.

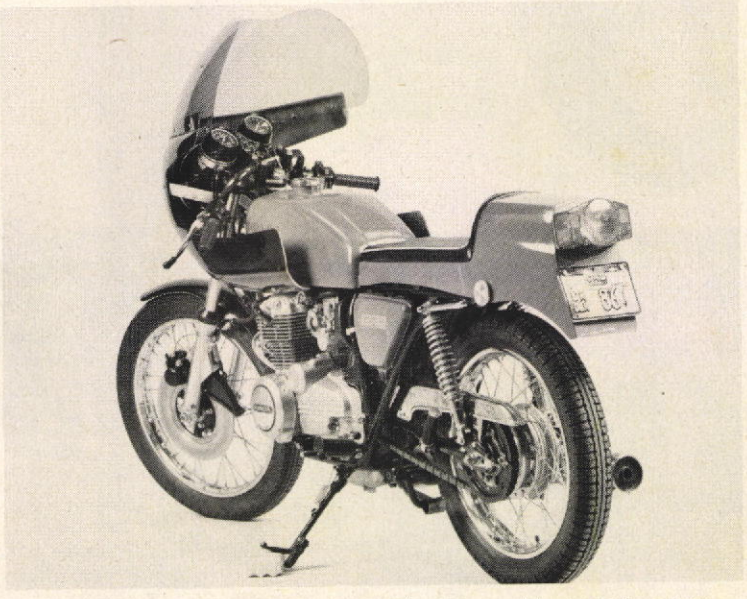
Fairings, most are fiberglass, come in three basic styles; quarter, half, and three-quarter. Each designed for a guy's particular want and check book. Then there's exhaust systems. Two-into-ones, four-into-twos, and four-into-ones; flat black or chrome plated, all trick. The subject is big, choice huge.

It's obvious Honda's 400/4 Super Sport was designed to capture the fancy of those who are caught up in the cafe thing. Its styling is just a half-turn away, the four-into-one exhaust system is the clincher.

We got this bike for test and realized what many would-be owners may be doing with it in the future. The 400/4 was too new for any of the cafe houses to have tooled up for. We ran a little crash program with Dick's Cycle West. What you see is their effort of what we think is a pretty wild bike. •







Riding position, which uses the standard rear set footrests is not as severe as a true road racing crouch. You can look over the windscreen. Long seat allows room for another person. Stock headlight is fixed to the fairing, it doesn't turn with the handlebars. Honda tank fits into the seat/fairing scheme so there's no need to purchase another.

A PAIR OF PANTHERS

The Black Shadow easily adapts to off-road situations even airborn flights. Good skid plate protects the undercarriage from harm.

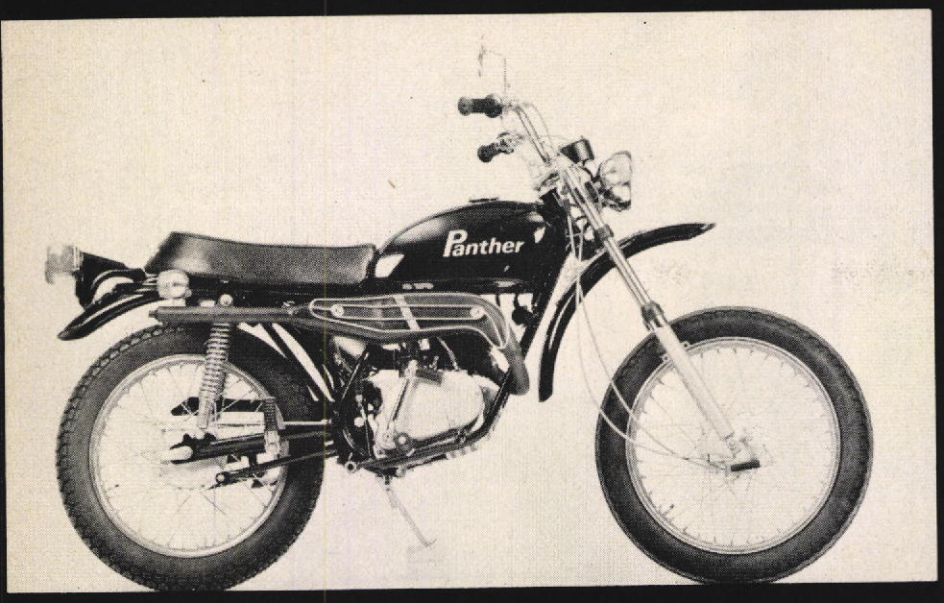
Taiwan's Latest Offering In Off-Road and Street Trim

Panthers used to come from England but with the current state of the world's motorcycle manufacturers, the name now originates in Taiwan. While there's no relationship to the older version, the makers have borrowed yet another oldie but goodie name to describe one of their models. Would you believe a Panther Black Shadow? Well neither would we if we hadn't ridden one.

Like several other Taiwan offerings, the Panther bears a strong resemblance to a Japanese machine of several years ago. In this case a Yamaha. Through some arrangement or other, the Taiwanese are able to either use old tooling or copy older designs for reproduction. Not that that's all bad, for in this case they're copying a rather successful machine.

Offered in two models, the Black Shadow for off-road and the Super Sport for around town, the Panthers share a common engine. A 175cc piston port two-stroke with a radial-finned head developing a claimed 17hp. The engine sports oil-injection and a five speed transmission.

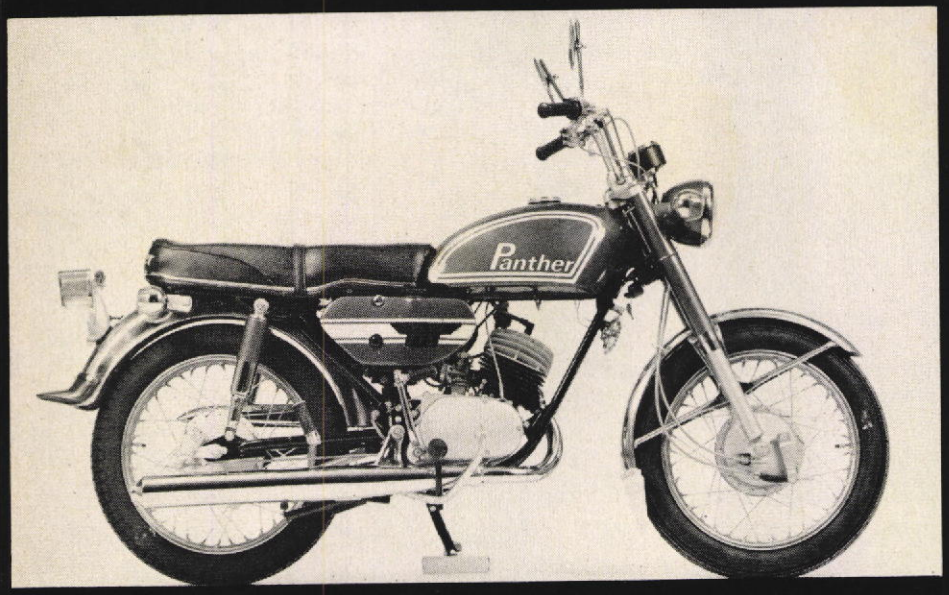
We spent an afternoon with each of them and were impressed with their ability to handle anything asked of them, as long as their original intent was kept in mind. The machines are basic, not intended to out-horsepower or out-handle the current market leaders. They are intended to be transportation machines with a flair. The Super Sport will get you back and forth to work practically forever while the Black Shadow will allow occasional trips off the road. The more occasional the better since it is in no way an off road machine in spite of its upswept pipe and skidplate. It too is intended for around town errands or short commuting. ●

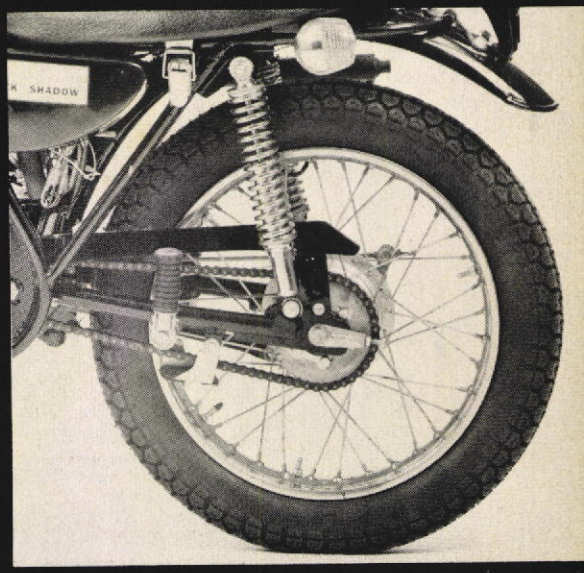


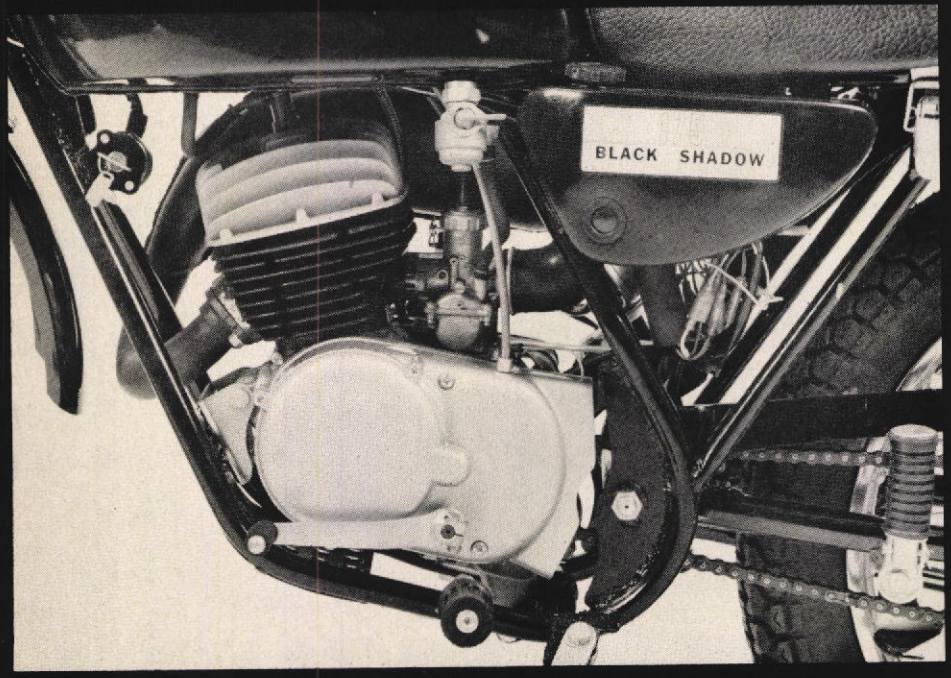
The Shadow is finished in jet black and can also be had with knobby tires. Passenger pegs allow two to enjoy the fun.

The Super Sport is a streamline street package. A quiet muffler along with oil injection makes for carefree trips around town.

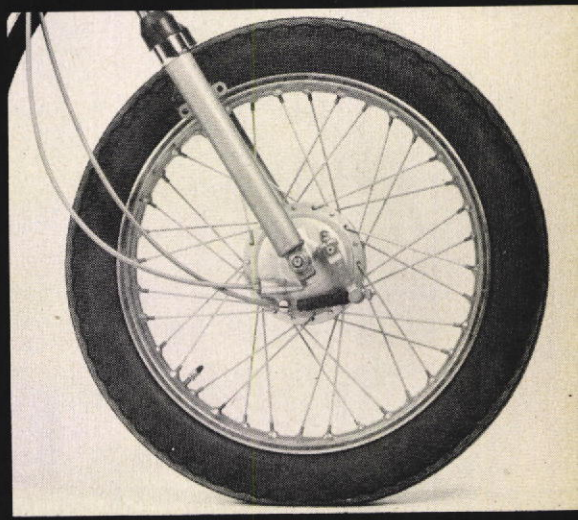
3-way adjustable shocks are standard along with a chain guide which helps keep the chain aligned with the sprockets.







Both models feature a sunburst head that is becoming standard on many bikes. Notice the ample frame gusseting while little effort is made to hide the electrical wires.



Front suspension is a little weak for serious off-road riding. The 3.25-19 street tire gives limited traction in the dirt.

What is a president? He makes big financial decisions and decides company policy, sits at the head of the board table and appears at company functions. What's an enthusiast? He rides the wheels off motorcycles; the guy you want alongside when something goes wrong in the woods, for he can handle any greasy hill and knows every nut and bolt on the bike. With two exceptions the rolls are worlds apart.

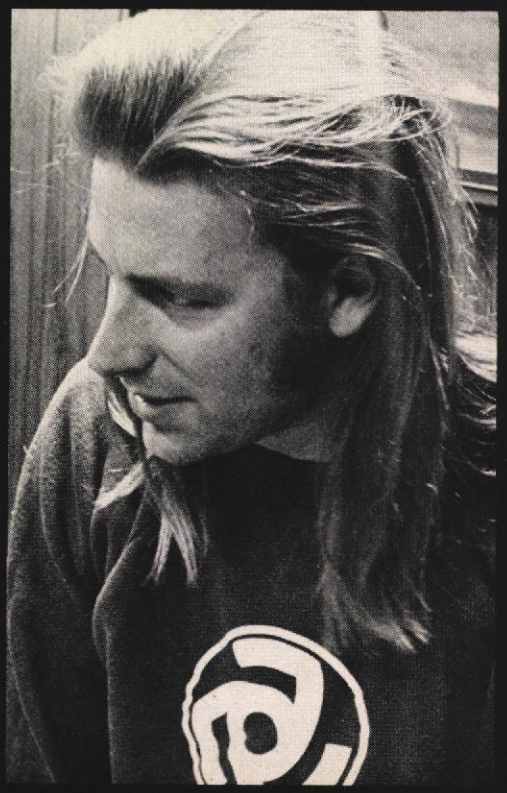
John Taylor, President of Ossa-distributing Yankee Motors is one of the exceptions. The other fathered the machine that ushered John into the sport in 1952, Ferdinand Xavier Bulto. For reasons now obvious, John Taylor gravitated to the Bultaco, cutting a swath of woods victories including a Jack Pine win, Berkshire gold medals and a bronze in the '64 Six Days Trial in East Germany. He's competed in every field of competition, embracing hillclimbing, half-mile, mile, ice racing and road racing. Only speedway has eluded him, but he's not through.

John got so carried away with the Bultaco that in 1962 he started importing them into the States, switching to Ossa in 1967 when they conceded to build his dream bike, the Yankee Z Enduro twin based on two Ossa Pioneer singles side by side. Scheduled for market in 1968, engine production delayed its appearance until 1972, missing the wave due to rising manufacturing costs. But with the new street bike phenomenon, a scalding, staggered-crank street version of the Yankee is once again a practicality and John Taylor will finally achieve his ultimate obsession of fielding an all-American Yankee roadster in 1975.

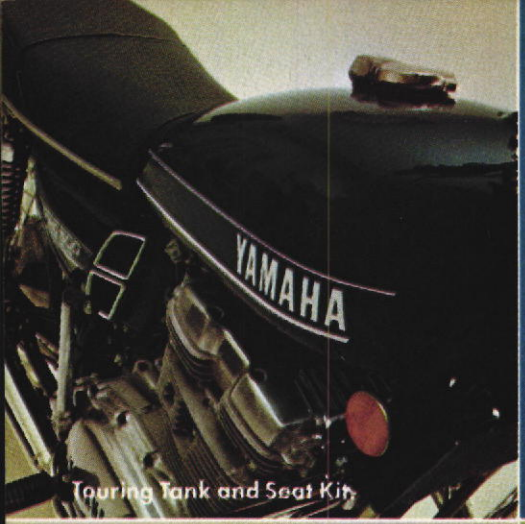
Yankee Motors President John Taylor... a riding executive

In a whirlwind ten years, Craig Vetter shot from a BFA degree in Industrial Design at the University of Illinois to latter day father of the fairing and, more recently, savior of the sidecar. It's difficult to say whether Craig is faster with a sketch pad or his Honda 250 XL on the dirt track out back of the Vetter Fairing Company's spacious grounds in Rantoul, Illinois, but for sure neither his charcoal pencil nor his dirt bike are quick enough to keep pace with his rapid-fire mind that created the world's most popular "Windjammer" fairing, the newest concept of which was designed for and accepted by the Harley-Davidson Motor Company for their immortal Electra-Glide. Never tiring of challenging the industry, his latest venture has taken him into the till-now-dormant field of motorcycle sidecars, culminating in the exciting and sophisticated "Terraplane." Those who have seen it predict it will move the third wheel forward, if not overnight, surely in the near future. And now he is off on a new venture, the "Mystery Ship," and we haven't a clue as to what it's about. Keep your eye on Achiever Craig Vetter.

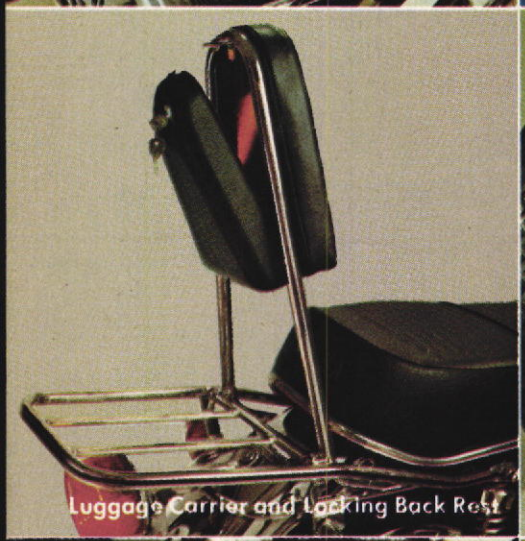
Never tiring of challenging the industry, Craig Vetter

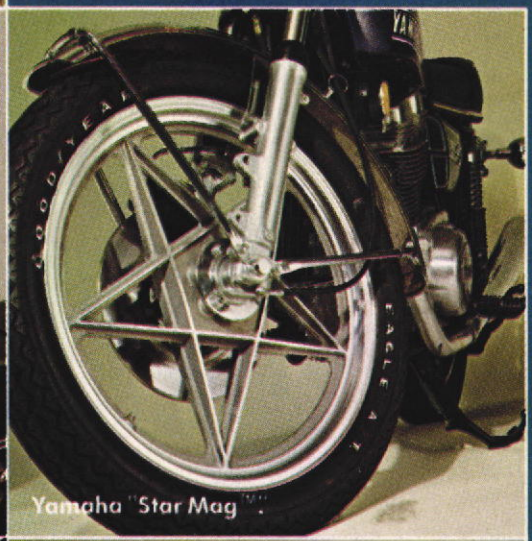


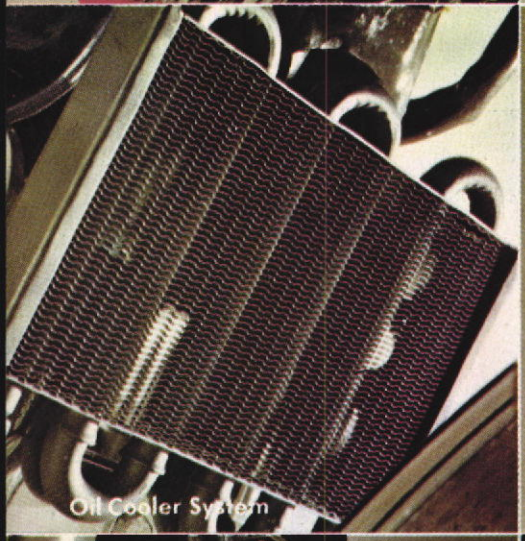
BUILD UP YOUR BODY.



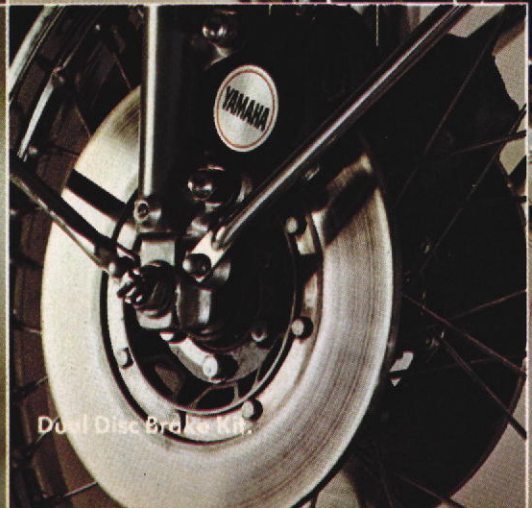
Touring Tank and Seat Kit.


Luggage Carrier and Locking Back Rest.

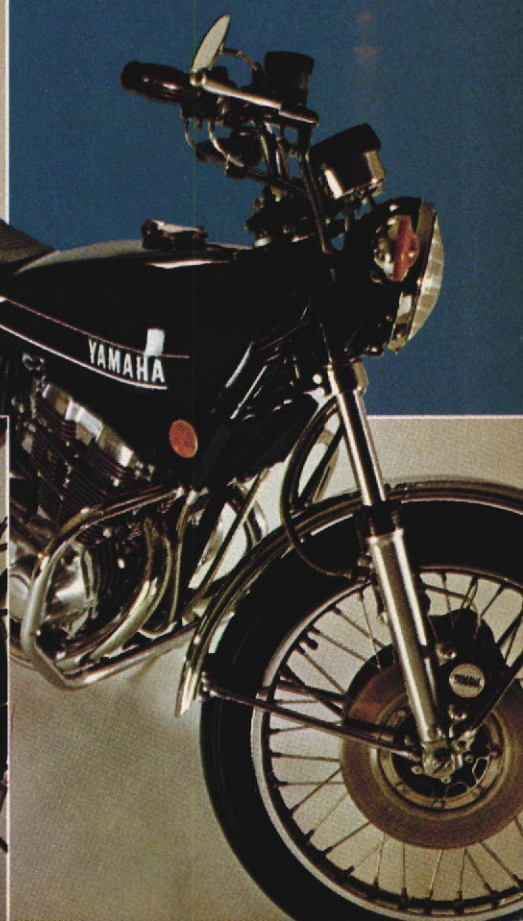

Yamaha "Star Mag".


Oil Cooler System.

Safety Bars.



Dual Disc Brake Kit.



Here are some new ways to shape up for street riding, from Yamaha.

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First, tone up with our new easy-on Oil Cooler system that will actually increase transmission, clutch, and engine life. It features a swirl-cool core and braided stainless-steel lines.

Or develop more braking power with a big Dual Disc Brake Kit.

Give your body more versatility with a Luggage Carrier and Sure-Support Locking Back Rest—specially tested for passenger comfort and featuring a locking 2" compartment.

And protect your body with sturdy, double-nickel chrome steel Front and Rear Safety Bars (with precision brackets).

And to go farther, in comfort—try our big bike Touring Tank and Seat Kit.

Stronger and lighter than any stock spoke wheel, the "Star Mag" bolts right on to Yamaha forks retaining all original equipment disc brakes, bearings, axles, etc. No more truing and adjusting spokes. Each wheel is perfectly concentric—a perfectly balanced wheel and a smoother ride.

Ask your dealer about his entire collection of special body-builders (for your Yamaha from 200cc to 750cc).

He's in the Yellow Pages.

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Racing a motorcycle without changing gears? No way! You wanna' bet.

By Tony Murphy

The Rokon can be ridden just like a 'normal' racer, with the obvious exception of an inactive left hand and left foot. Sliding, jumping, accelerating . . . it does it all.

ROKON 340 MOTO-CROSSER

Somehow the thought of an automatic transmission motocrosser lacks pizazz. Poppin' wheelies, shooting berms and lofting the front wheel over rutty terrain just didn't seem to us to go along with a "slushbox". It evoked thoughts of slowly grinding up otherwise impossible hills and lugging, rock by rock, up a slippery streambed but it just did not seem like the kind of machine that could be ridden hard and fast on a difficult moto-cross course at competitive speeds. How wrong we were. Rokon's new MX-er has pizazz that it hasn't even used yet. We'd ridden Rokons before and watched them in various enduros including the ISDT but still failed to fully realize that they are a good deal more than a novelty. The fact that there's no shift lever or clutch lever has little to do with the function of any machine, whether it has a manually-operated transmission or not. All they do is allow the rider to change gear. The Rokon changes automatically, when the engine speed and ground speed need another ratio, not when the rider thinks it does, therefore eliminating one of the vital thought processess and making the rider's job that much easier.

Accepting the fact that the infinite number of gear ratios offered by the Rokon is it's single most unique feature, the rest of the motorcycle can be evaluated as a "normal" moto-crosser. If normal is a term that can be applied. The transmission of power will have a great deal to do with the rider's progress but the chassis and suspension will still have to be up to par to carry even the best rider with the best engine across the rough stuff.

ROKON 340

With these things in mind we developed the proper attitude for evaluating such an unusual concept for motocross. Aware that we'd probably have to learn to ride a little differently, none of our early riding mistakes were blamed on the Rokon. We spent a whole morning just trying to get used to "changing gear with the throttle" and finally came to feel half way proficient. However, it would take several races before the riding technique would become natural.

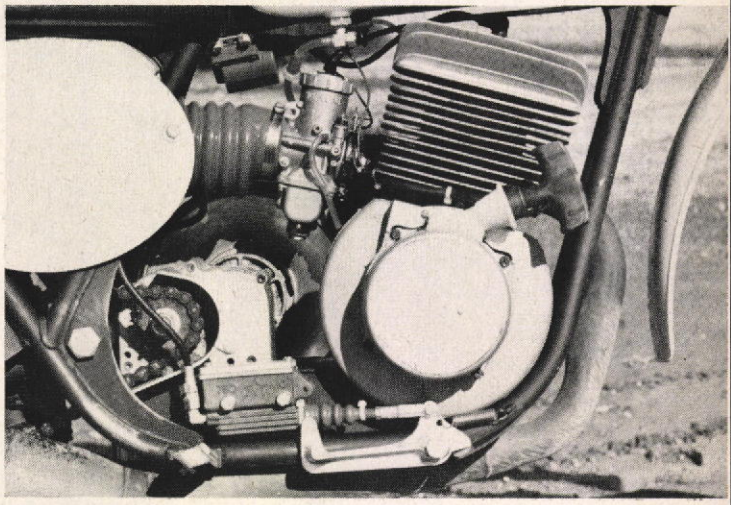
All of these riding peculiarities are due to the the novel method of transmitting the engine's power to the rear wheel. The engine itself is very conventional. A Sachs piston-ported two-stroke displacing 340cc, Rokon rates it at 37 horsepower. With 28 ft. lbs. of torque, a 36mm Mikuni and a Bosch magneto, it has all the specifications to make it a competitive powerplant. In fact, due to the type of transmission, the engine could well be one of those that would otherwise be called peaky. However, since the transmission is always in the right gear there's really no way for the rider to determine if this is so. One thing's sure. It doesn't lack the acceleration to make it competitive.

But what about this magic transmission. How does it work? And more important, does it work as well or better than a conventional system? Is it the death knell of the manual transmission?

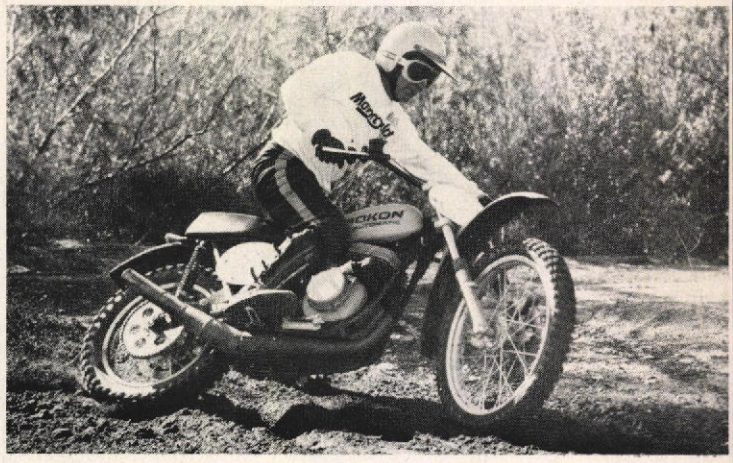
The primary drive system has many names: automatic torque converter, Salisbury clutch, variable sheave. Whatever you call it, it's one of the simplest and most efficient means of transmitting power yet devised by man. The system is so simple as to be confusing. Once the left side cover is removed, all that's visible are two pulleys and a rubber belt. The smaller of the two pulleys is attached to the engine's crankshaft while the large one is attached to a shaft protruding from a small gear reduction box mounted behind the engine. That small box contains a set of sprockets and a triplex chain to accomplish a 1.73 reduction before the power reaches the final drive sprocket on the other side of the box.

As engine speed increases, so does the speed of the small, crankshaft-mounted pulley. Attached to the small pulley is a bell-shaped housing containing spring-loaded centrifugal weights that are flung out from their pivots by rising rpm and force the two

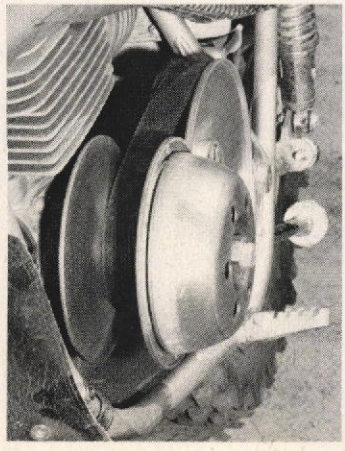
Right: Riding the Rokon on a motocross course takes a little getting used to, but once the rider masters the technique it seems very natural. The chassis and suspension are very conventional and complement engine.



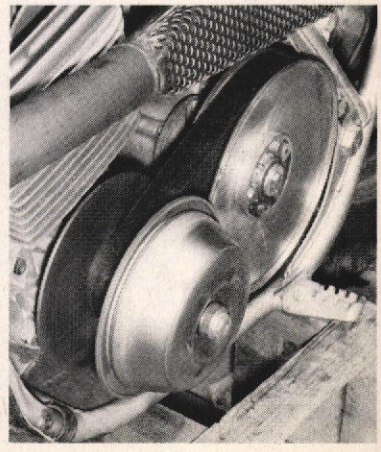
Right: Since there is no normal drive from the engine to the transmission, a kickstarter cannot be used. A recoil rope pull on the end of the crankshaft is used to crank engine. Note rear brake and reduction gearbox.



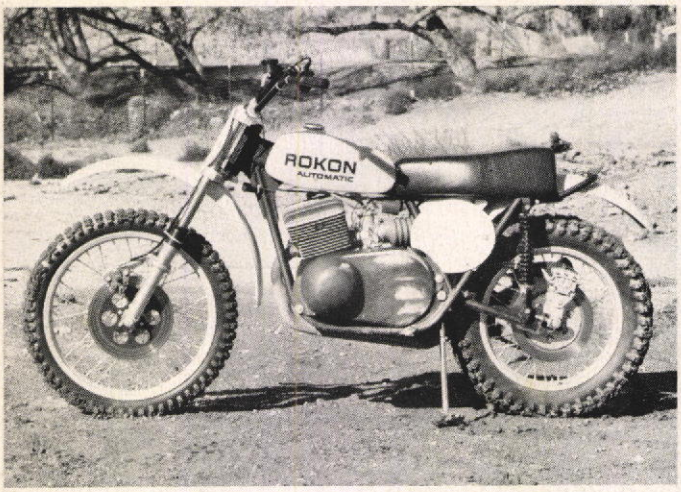
Right: In spite of it always being in the right gear, and being reluctant to spin the rear wheel, the Rokon can still be made to slide on command. It takes a little different technique, but it can be mastered in a few hot laps.



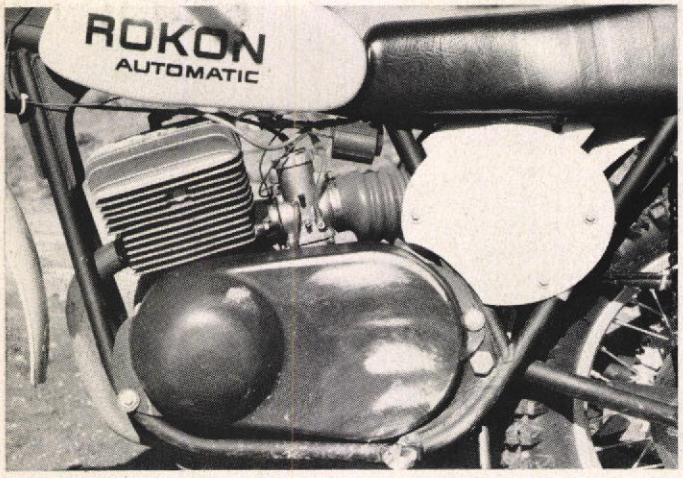
Right: When the engine is at idle, or stopped, the front pulley is spread apart and allows the belt to drop to a smaller (low gear) diameter.



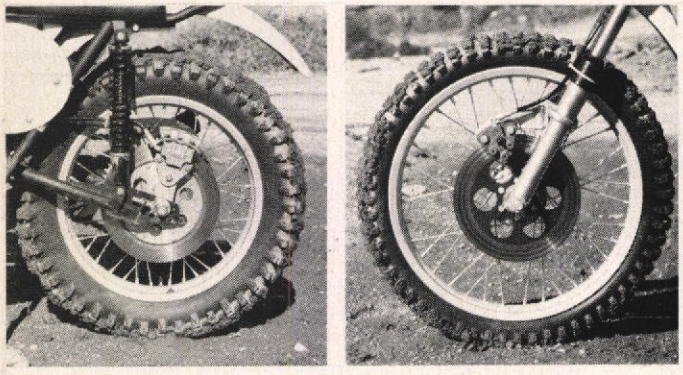
Far Right: As the engine is revved up, the spring-loaded weights in the bell-shaped housing force the pulley halves together and raises the gear ratio.



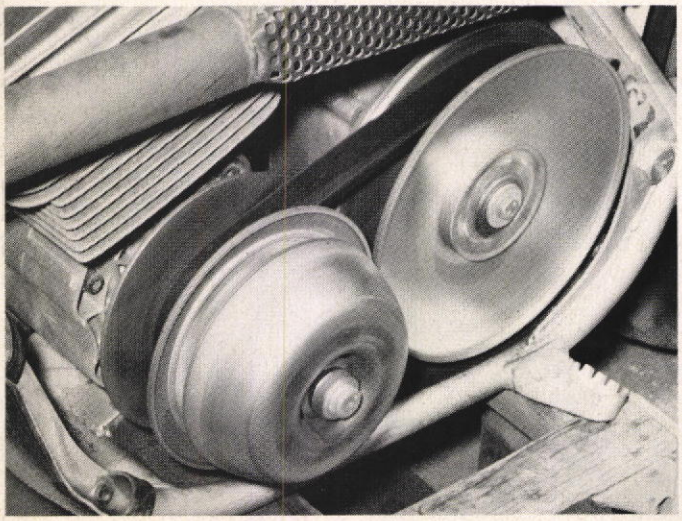
Left: Rugged and businesslike in its appearance, the MX version of Rokon's automatic shows little external sign of the various innovations. Disc brakes are rare on moto-crossers but the Rokon proves that they work.



Left: Sachs engine has gobs of power, sports a 36mm Mikuni carburetor and Bosch magneto. The large primary cover only covers the pulley and belts. It does not fully enclose them. Air cleaner is under well-padded seat.



Left: Front and rear wheel disc brakes are mounted on spoked wheels. The enduro model uses cast alloy. Tires are Carlisle and don't use security bolts. The rear swing arm has high-mounted axle and forward shock mount for long travel. Sidestand detaches.



Left: As the front pulley closes up, the belt forces the two halves of the rear pulley apart. This raises the gear ratio. When the power is turned off, the front pulley moves apart and the rear one moves together. This lowers ratio.

halves of the pulley closer together. This in turn forces the drive belt to a larger front diameter and effectively raises the gear ratio. Meanwhile, the increasing diameter of the belt around the closing front pulley pulls the rear section of the belt deeper into the rear spring-loaded pulley halves, forcing them apart. The two operations actually happen simultaneously, raising what is essentially the primary gear ratio.

Other than it's simplicity, the system has a built-in ability to adjust itself to the demands of the engine and the terrain. As engine rpm drops, the centrifugal weights allow the front pulley to move apart so that the belt drops within the halves and lowers the gear ratio. Under acceleration, the slightest wheelspin causes the gear ratio to raise and therefore eliminates wheelspin. For this reason the Rokon amazes one and all at how well it gets a hold on the ground. All the rider does is grab a handful and let the Rokon do the rest. A sensitive throttle hand is not essential although, as we later found out, it can be an advantage in the really rough going.

Give a little thought to the foregoing and you'll realize that under all conditions the Rokon is in the right gear. On occasion, such as a series of hoop-de-doos, the system may become slightly confused, but providing that the rider does not just keep the throttle wide open all the time, the confusion is minimal. At the start of an event the initial wheelspin is virtually eliminated by the primary system, allowing good straight starts without the need to feather clutch or throttle. It's as close to an ideal transmission as one could want—once you get used to it.

The chassis in which this unique power-delivery system is housed is very conventional, also very functional. A single-backbone, double-loop frame boasts both light weight and simplicity while the Betor front forks and Koni rear suspension unit's reputations speak for themselves. The rear shocks have been moved forward on the swing arm in current MX fashion in order to provide more rear wheel travel, and both ends behave exceptionally well. Never once did we feel anything but confident.

When the Rokons were first introduced they featured cast alloy wheels and disc brakes as well as the innovative transmission. In fact the enduro model still has them but the moto-crosser mounts its front and rear discs on conventional lace-up spoke wheels, a 21-incher in front and an 18-incher in the rear. We're not sure why but suspect that the cast wheels are heavier than the lace-up variety.

The small capacity fuel tank is of the

continued on page 76

10 MINUTE TUNE-UP

A Quickie Way to Keep Your Honda Four In Tip Top Shape

by DAIN GINGERELLI

Multi-cylinder motorcycle engines can create a hassle for the owner when it comes time for tune-ups. Most Japanese multis have two sets of points that direct the spark to two separate sets of cylinders. In the case of Honda fours, numbers one and four cylinders use the same points, and numbers two and three are partners. This means that both sets must be spot-on for optimum performance.

One way to check timing and dwell is with a feeler gauge. This is the "sort-of-accurate" way to do it. There are many factors to consider, such as geometry of the feeler gauge when measuring gap, and the wear in the points themselves. Any variation in either of these two can throw the entire setting way off.

Another way to check timing and dwell is electronically. This is a better method of doing it, as there is very little room for error as it is all measured in percentages on a gauge. The electronic impulses are constant all the time, so you know that what the meter reads, the engine is doing each and every time. Honda fours are particularly difficult to tune, unless it is done electronically. One of the best ways available is with Action Fours' Trigger-Dwell. Trigger-Dwell is a small box that reads the dwell of a Honda Four engine's points, and transforms the reading into percent. Using percent, instead of degrees, helps alleviate chance of error when checking the dwell.

Dwell is the length, or amount, of time the engine ignition points are closed. Using the Trigger-Dwell box, Action Fours found that Honda engines run best with about 42% dwell. It will naturally vary with each engine and the state of tune, but anywhere between 40 and 42% dwell is good. Using Trigger-Dwell makes the matter a simple mechanical procedure. All that is needed is the box, a screwdriver, and a timing light to set the timing afterward. This will ensure that the timing is set right-on with the dwell. Doing it statically, like the feeler gauge and dwell, creates room for error, and a poorly performing engine. With these three tools, you can make a Honda 350, 400, 500, 550, or 750 run like a champ.

To begin, remove the points cover to expose the points. Connect the timing light to the battery, and clip the high tension lead to the terminal on the panel of the Trigger-Dwell box. Ground the black lead from the box to the motorcycle. A section of the frame is good enough for this. Next thing to do is connect the red leads to #1 and #2 hot sides of the points (1 goes to the points on the left, 2 on the right). With this, you are ready to set the dwell on your Honda Four.

Turn the engine switch on, and set the switch on the panel to 1 (left). Zero in the Trigger-Dwell, using the calibration screw to the left side of the number one. After this is done, you can turn the engine over, and begin checking the dwell for both sets of points. Set the switch on 1 (for 1 and 4 cylinders), then check the meter to see that it reads on 40. If it is below 40, then you will have to close the gap a little. Set the dwell so that the meter reads between 40 and 42. After you have set side 1, turn the switch to number 2, and set the dwell for the #2 set of points, which supply spark to the two inside cylinders. Follow the same procedures as for #1.

When this is complete, the engine is ready to be timed. There are marks set on the points plate by the factory to help do this. Although most engines are in tune using just these marks, sometimes it is necessary to re-adjust the timing on some for better performance. This is sometimes dependent on the state of tune of the motor. A stock machine shouldn't be too far off these marks. Using the factory marks, there is an "F" on the disc, to designate advance for the #1 set of points. Exactly 180 degrees is the mark for #2 set of points. Line both of these marks up to the timing mark on the points plate. Use the timing light for this. Switch the Trigger-Dwell on 1 and 2 to check each side of the points.

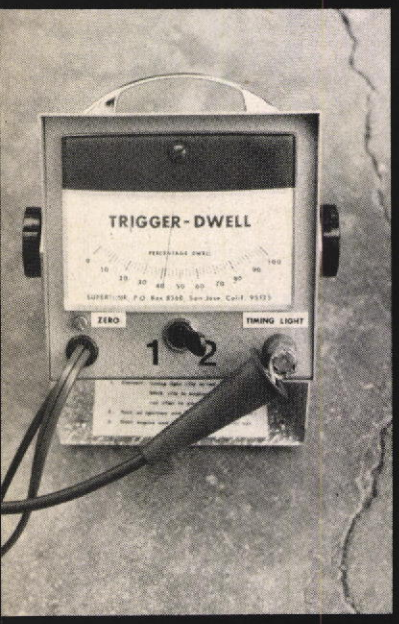
If the timing mark "F" is to the left of the points plate mark, then the timing is more advanced than necessary. This means that the spark is firing before it should. To retard it, loosen the points plate with the screwdriver, then turn it clockwise until the marks are lined up. When both sets of points have been timed correctly, go back and recheck the dwell, to make sure it hasn't jumped from 40-42. When both sets of points have their marks lined up, and both sets read 40-42% on the Trigger-Dwell, then the timing and dwell are set, and the bike should run a whole bunch better. Put the points cover back on, and go riding. If you really want to tune your Honda Four properly, the carbs should be synchronized, and plugs changed. Using factory recommended plugs, set the gap at about 0.024 - 0.028 inch. The bike should run much better, helping you fight air pollution and the energy crisis.

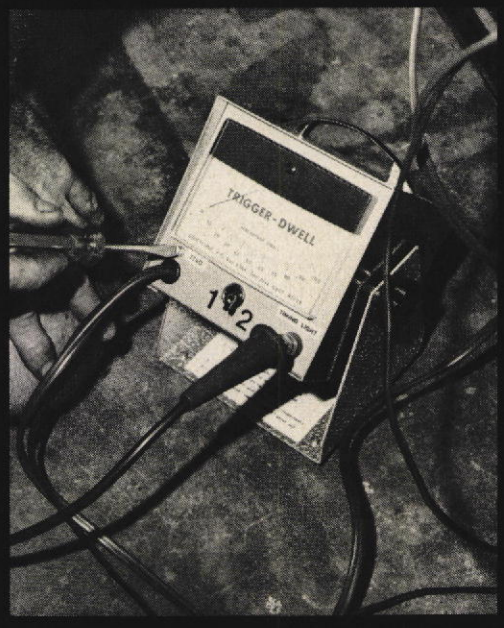
Timing a Honda Four can take ten minutes, or three hours, depending on the tools you have at your disposal. The Action Fours Trigger-Dwell cuts the time down to the ten minute neighborhood, and for this reason, many serious enthusiasts use it. The $130 price tag scares away some riders, but to get around this, some Honda Four owners clubs purchase it for the organization to help members tune their bikes, without having to shell out mucho money. Action Fours is located at 2621 South Main Street, Santa Ana, California 92707. •

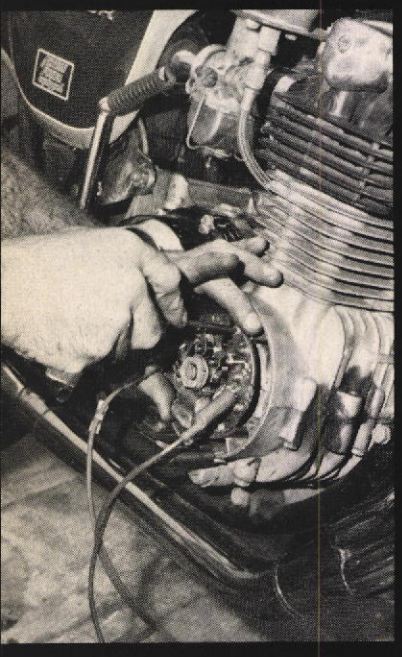
1 *Trigger-Dwell reads in percents, helps eliminate error. Both sets of points should read between 40-42 percent for best engine performance.*

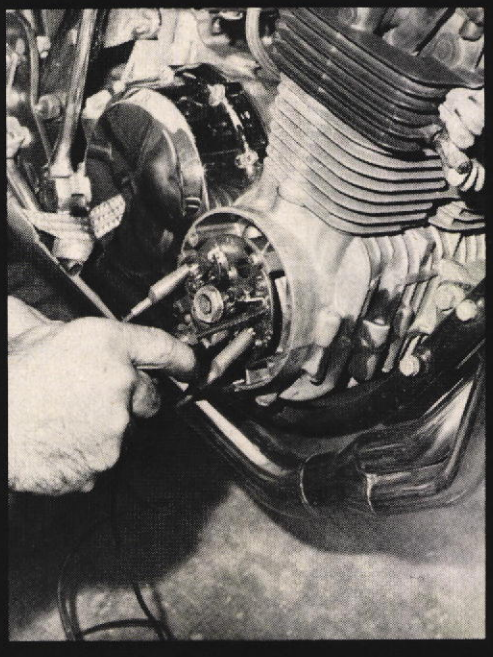
2 *The black lead from the box is grounded to the motorcycle. It can be attached to either the crankcases or frame tube. Red leads attach to points.*

3 *The gauge is zeroed with a calibration screw just to the left of the #1 switch. The switch controls the set of points being adjusted on scale.*









4 *First, each set of points is adjusted to the proper dwell by moving the point assembly itself. The needle should read between 40 and 42.*

5 *Next, the timing must be checked with a timing light. The point plate may have to be moved. Once the timing is set, re-check each point's dwell*

6 *A simple timing operation can take several minutes or more than an hour. It all depends on the quality of the tools and patience of the operator.*

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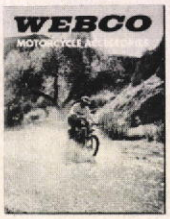

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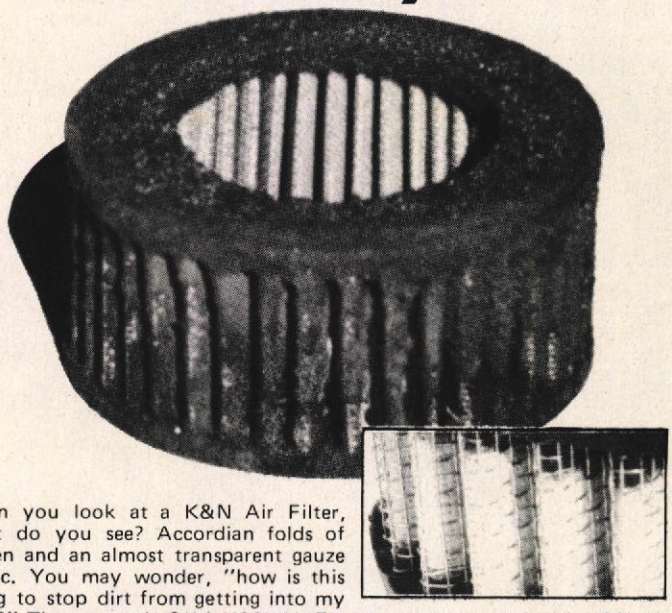

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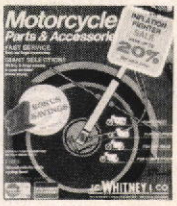

J.C. Whitney & Co. now produces a complete mail order motorcycle parts and accessories catalog. Lots of decorative chrome hardware is featured along with many engine replacement parts, precision engine tools and all kinds of customizing goodies. Their inflation fighter sale is on and many items are marked down 10% to 20%. Also included is an order blank and a chart showing State Cycling Laws. Send to J.C. Whitney & Co. 1917-19 Archer Avenue, P.O. Box 8410 Dept. MC, Chicago, Illinois 60680

KARVAN

Karvan International Inc. distributes a beautiful semi-gloss catalog showing all the latest parts and accessories to make your van more functional and to give it that customized look. Plush seats, bars and interior lights are shown for the inside, while fender flares, front hoods, spoilers and porthole windows are featured for the outside of your van. Get your catalog by writing to Karvan International Inc. 1024 South Linwood Ave. Dept. MC Santa Ana, Calif. 92705

COSMO

Cosmopolitan Motors, Inc. has put together a nice catalog with rider comfort and safety in mind. Lots of seats, goggles, gloves, helmets and boots are shown with an assortment of Pirelli tires also featured. All items are fully described along with clear photos. To get your catalog and order blank, write to Cosmopolitan Motors, Inc. Jacksonville & Meadowbrook Roads Dept. MC Hatboro, PA 19040

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HALLCRAFT'S

With a full color cover, Hallcraft's new catalog looks more like a magazine than a sales brochure. Their wire wheels are famous but the new offerings in the catalog will be appreciated by custom builders all across the country. Send $1.00 to Hallcraft's, 244 Millar Ave., El Cajon, Calif., 92020 for one of the best looking catalogs around.

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BE HOME FOR SUPPER

THE WAY I SEE IT, 16 is a freaky age. When you turn 16, you're turning a corner in your life, heading right down the road to what they call 'adulthood.'

I mean, now you can handle responsibility better than before, and you like the feeling. But there's a catch...Catch-16. Once people know you're more responsible, they give you more responsibilities. You just can't go out and enjoy yourself anytime you want. Those days are over. Now you earn your good times.

But if you're into motorcycles, like I am, it's worth it, for sure. Because here's the good part of Catch-16—the sooner people know you're responsible, the sooner you'll own a bike. That's what I found out when I decided I wanted a Kawasaki, the F-11 250.

Before my dad would talk about it, I had to get together all the facts and my friends' opinions and show him the specs and explain why the F-11 was the bike for me. Like it was simple to ride and very rugged and had a good reputation, and I could ride it to school or on trails. Then we agreed I'd help pay for it.

Now I'm so responsible I can hardly stand it, but I have more good times than ever. So when you're 16, you take your good with your bad. And maybe that's how it is the rest of your life. I don't know. I know one thing—when I'm 21, I'm moving into an apartment with maid service.

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Good times include riding safely. We recommend wearing a helmet and eye protection, keeping lights on and checking local laws before you ride. See Yellow Pages for nearest Kawasaki dealer. Member Motorcycle Industry Council.

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BRAKES—foot-operated rear drum brake, hand-operated front rim brake.

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1975 Triumph T160 Trident

ELECTRIC STARTER—thumb-controlled effortless electric starting.

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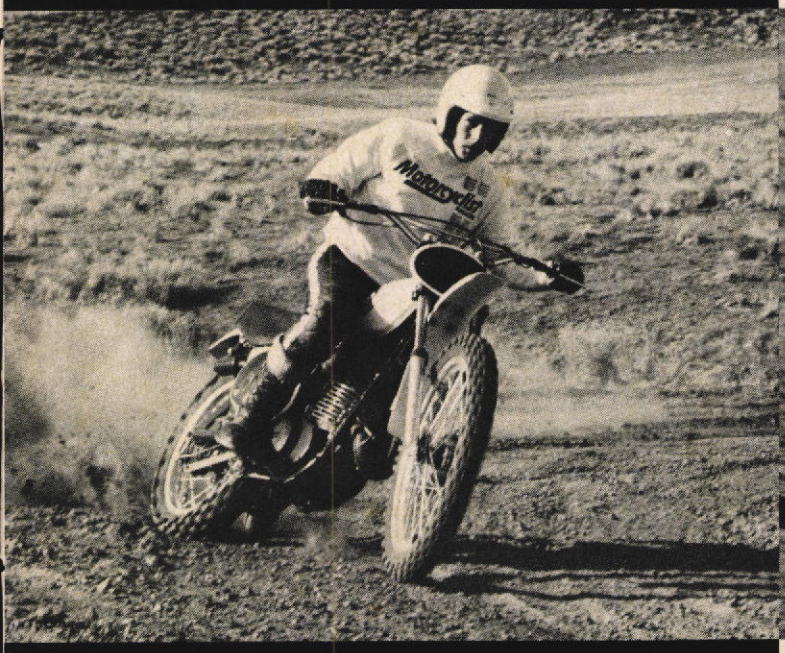
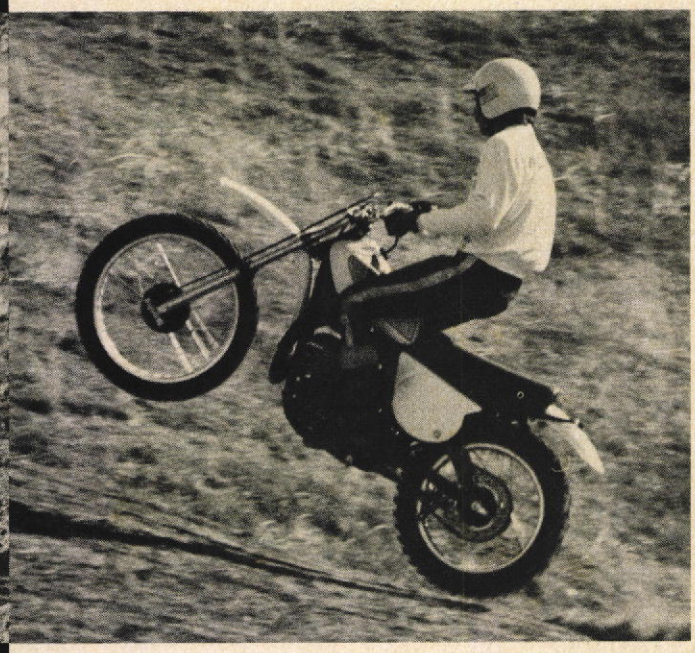
The New Monocross 400MX . . .

YAMAHA'S PURPOSE DUAL RACER





Here Is Your New Motocrosser, Scrambler, Cross Country Racer, And Play Bike; All In One

By Dave Ekins

Hey! Yamaha has put together a winner this time. They've taken all that monoshock technology learned in big time motocrossin' and built it into one super play bike. This new scooter is the best all-around racer we've seen yet. You can motocross it, scramble it, go desert racing, or just do a day's off-road playin'. The 400 MX will do it all. Pity though, with this new bike they've put all thieir previous models and most of their competition back on the trailer.

You know, a few years ago we could purchase a new MXer and race it a season or two and stay competitive. We would run through the usual number of shocks, tires, and chains, but all the bikes were pretty much equal and we could stay in the fray. Ain't that way no more.

In the past few years they've got 'em as light as they dare, and are pumping out more hp than most riders are capable of using. The last barrier to hurdle has been suspension. In just a little more than a year everything has been made obsolete with so many new moto-crossers offering nearly twice the suspension travel. And it looks like Yamaha has a handle on that with their Monocross.

Motorcyclist had an in-depth study of the monoshock in its July '74 issue, and a test of the monoshocked '74 Yamaha YZs in the November '74 issue. Now we're testing the 400 MX monoshocker. An all-around off-road racer with extra long travel suspension.

In case you missed those issues here's a simple explanation of this trick suspension. The rear fork fastens at the frame like any other swing arm. A single gas/fluid shock and spring are mounted above the engine fastened at one end near the steering head and to the swing arm at the other. The arm has to be a triangulated structure to

Below: Too much throttle gets the front end up even in third, also wears the knobby out in an afternoon.

YAMAHA'S DUAL PURPOSE RACER

accomplish this and consequently weighs a bit more than a conventional swing arm.

The shock unit is designed for this one purpose. The damping works with hydraulic fluid and it, the fluid, has a reservoir to flow into when the piston shaft displaces the fluid on the compression stroke. The reservoir, which is a cast aluminum bulb, has a neoprene diaphram separating hydraulic fluid and nitrogen gas. When the fluid moves into the bulb the gas, naturally, compresses. The purpose is to have nothing but pure hydraulic fluid passing through the valves to give a constant damping action. The nitrogen gas is injected under about 280 psi which can be varied 50 psi in either direction if one wants to fine tune the action.

A better choice if you're wanting to fiddle with the Monocross is simply fitting one of the two additional springs. Supplied with a constant-rate spring of 29.6 psi, 27.5 and 30.3 pounders are available.

From the point of view of the owner, a monoshock should last longer than those bikes with moved up or laydown shocks. On a typical moved up unit the shock will have 3.3 inches of travel and the rear axle 5.5. The monoshock moves 4.25 inches allowing 4.75 at the rear axle. This is pretty close to a 1:1 ratio. An additional advantage of the single unit is it does not have to match up with the one on the other side of the swing arm.

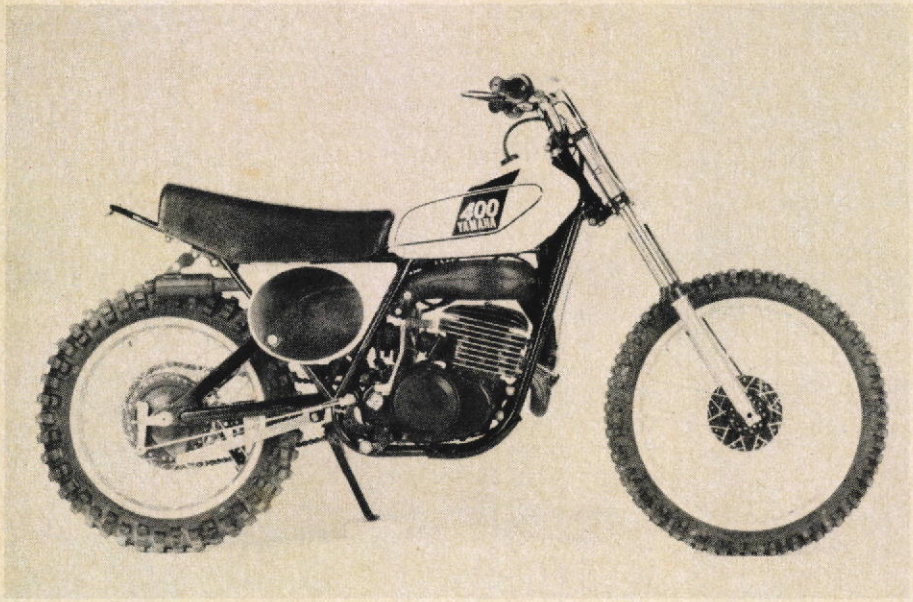
While still on the subject; the 400MX forks are very similar to those off Yamaha's 360YZ. The bike we had seemed a little fluffy in its hydraulic control, but this can be corrected simply by going to a 20 or 30w fork oil. Travel of the forks, by the way, is 7.6 inches. We couldn't get 'em to top or bottom with the lighter fluid, they just felt soft.

They call this a brand new motorcycle, because it's a 400. The bike really is a 360YZ with some minor changes. It has a 2-plus gallon fuel tank, still made from aluminum but bolted instead of held down with straps. Seat and side panels are also a little different and additional covers have been added to the air filter box. Outer engine covers are different but we suspect the inner cases and workings to be the same other than a variation in gear ratios. Both are classified as medium-close-ratio five speeders.

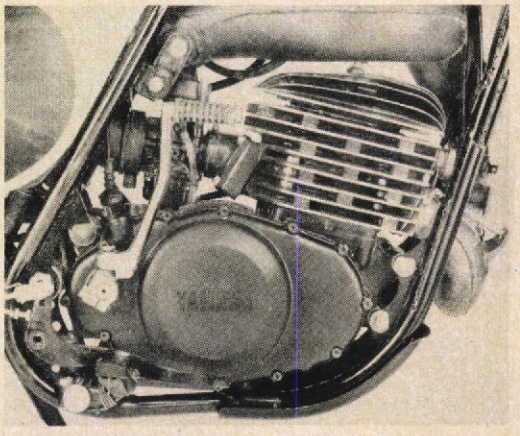
It has a new head, cylinder, and piston. The 360's 80 mm bore is pushed out to 85, the 70mm stroke's the same. The piston is the first slipper type we've seen on a 2-stroke motorcycle. They've also cast four vertical slots near the wrist pin boss probably to control distortion. The MX also carries two rail type piston rings instead of the YZ's one.

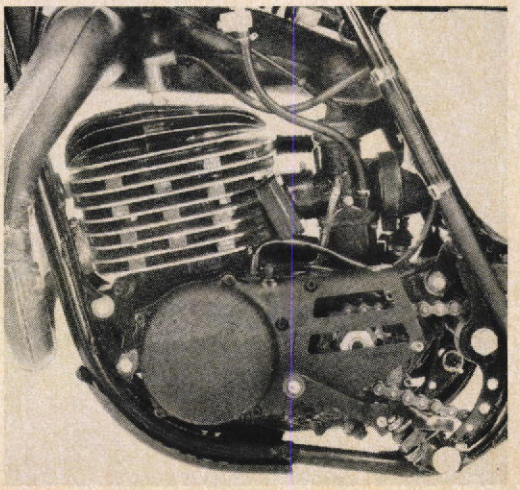
Typical of YZs is quick throttle response, too quick unless you're as well tuned as the bike. The MX has as near perfect a power response as we've ever seen. It's one you can dial wheelies, wheelspins, and powerslides with. We'd normally attribute this to exhaust port timing, but in the case of the YZ and MX there's only a degree different; 83 versus 82 after top dead center with the MX getting the longer count. We feel the gentle surge is from the larger flywheel fitted to the MX. The little rotor just doesn't live there any more. This flywheel and a few other things makes the MX twelve pounds heavier than the YZ.

Whats it like to ride? Exciting, slick, confidence inspiring, all these things. To begin with, the 400 is easier to start than a 125. Yeah, really. A kick start lever operated compression release opens a valve in the cylinder and its just like kicking over nothing. 1st gear is tall and 5th will probably get you running about 80 mph. Its got so much torque you'll get nothing but wheelspin from the big 4.60x18 rear knobbie and it doesn't matter what gear you're in. You've got enough control with the throttle to steer the bike with the rear tire which makes it about the best fire-roader we've ever ridden. And if you're



The 400MX is made from so many YZ pieces its hard to tell the racer from the play bike. Obvious distinction of the MX is absence of tie-down straps for the fuel tank.





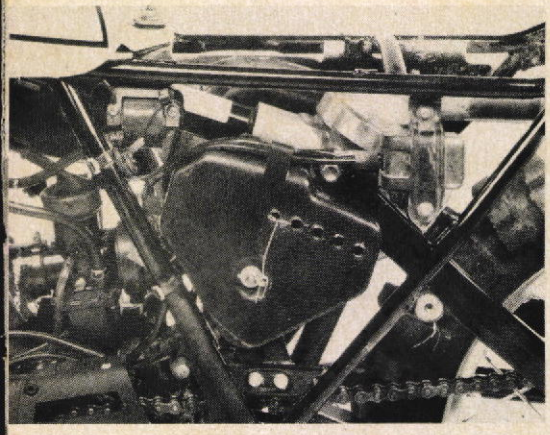
Top Right: Bottom half of engine is mostly YZ; head, barrel, and piston are strictly 400MX. Helical gear primary drive differs from straight cuts found in the YZ. Right: Mag cover has bigger dish to allow for 400 flywheel. Magnesium primary sprocket cover is more elaborate than YZ's.

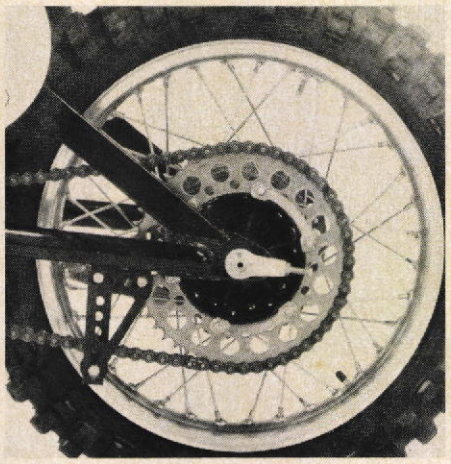
bag is wheelies it'll do that all day.

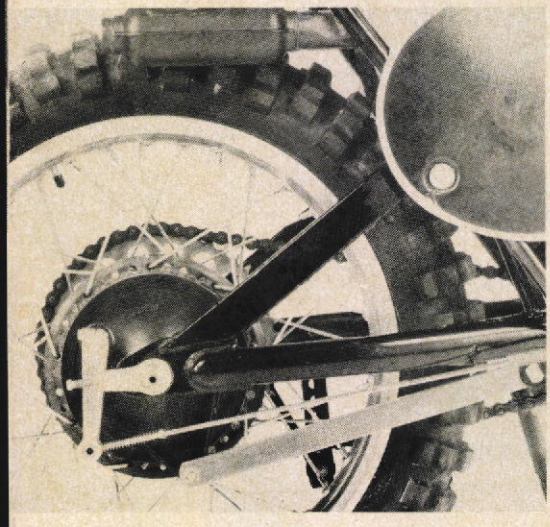
Rear suspension feels stiff when you're bouncing in it in the showroom floor but don't let that fool you. When you ride the thing it feels like you're on one giant cushion just soaking up everything. It'll give you a little fright when descending a long bumpy downhill. If you're doing a normal throttle-off downhill, the back end wants to do a topping act. The cure is a change in riding style, just give it a small amount of throttle and use the rear brake.

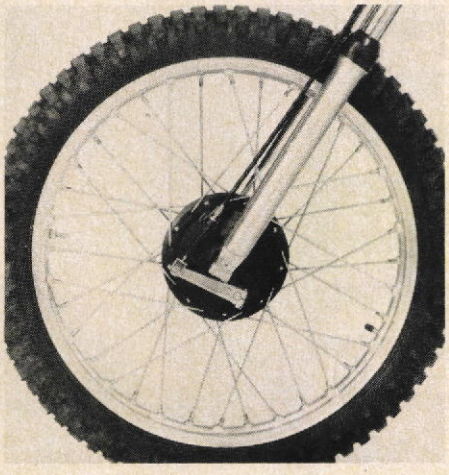
Brakes are responsive, too good if you're not used to 'em. A Yamaha trademark. We like this effort from Yamaha because they've built a bike that'll do the job most anywhere off-road. In racer fashion it uses a pre-mix (20:1) no injection. Its tame and strong, a combination you can't find often. Simply; they've civilized an excellent moto-crosser, the YZ, into a serious play bike for everyone. •

Below: Long power from 400 engine coupled to rough terrain absorbing suspension makes this kind of riding pure enjoyment.





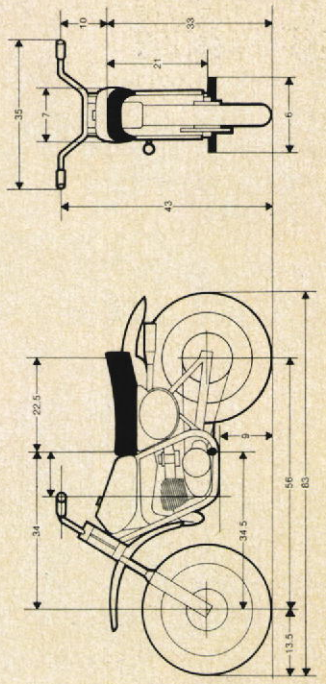




Top: Coil, (under rear gas tank hold down) and CDI unit, (above and behind air filter cover) are mounted in a unique area of the frame. We wired the wing nut on air filter cover because it likes to disappear. Above: Strange triangle shapped swing arm is current Monocross practice. Brake anchor looks to be hand fashioned from aluminum bar stock. Braking action is sensitive, takes some getting used to.

Top: Lightweight aluminum alloy sprocket is drilled to shave even a few more ounces from unsprung weight. Three locking tabs for holding sprocket nuts are indication of bike's race-bred thoroughness. Above: Fork looks like current YZ's, it isn't. This fork holds a wee bit less fluid Yamaha say the YZers can use 10,20, or 30w. Front wheel is a YZ part including the magnezium cover.

ALL DIMENSIONS IN INCHES



YAMAHA

400MX

TEST BIKE:

Base price as tested	N.A.
Factory warranty	None

ENGINE

Type	2-Stroke single, reed valve
Displacement	397cc
Bore x stroke	85mm x 70mm
Compression ratio	7.57:1
Lubrication system	Mixed gas 20:1
Carburetion	38mm Mikuni
Air filter	Wet foam
Ignition system	CDI magneto
Starting	Primary kick
Exhaust	Upswept

DRIVE TRAIN

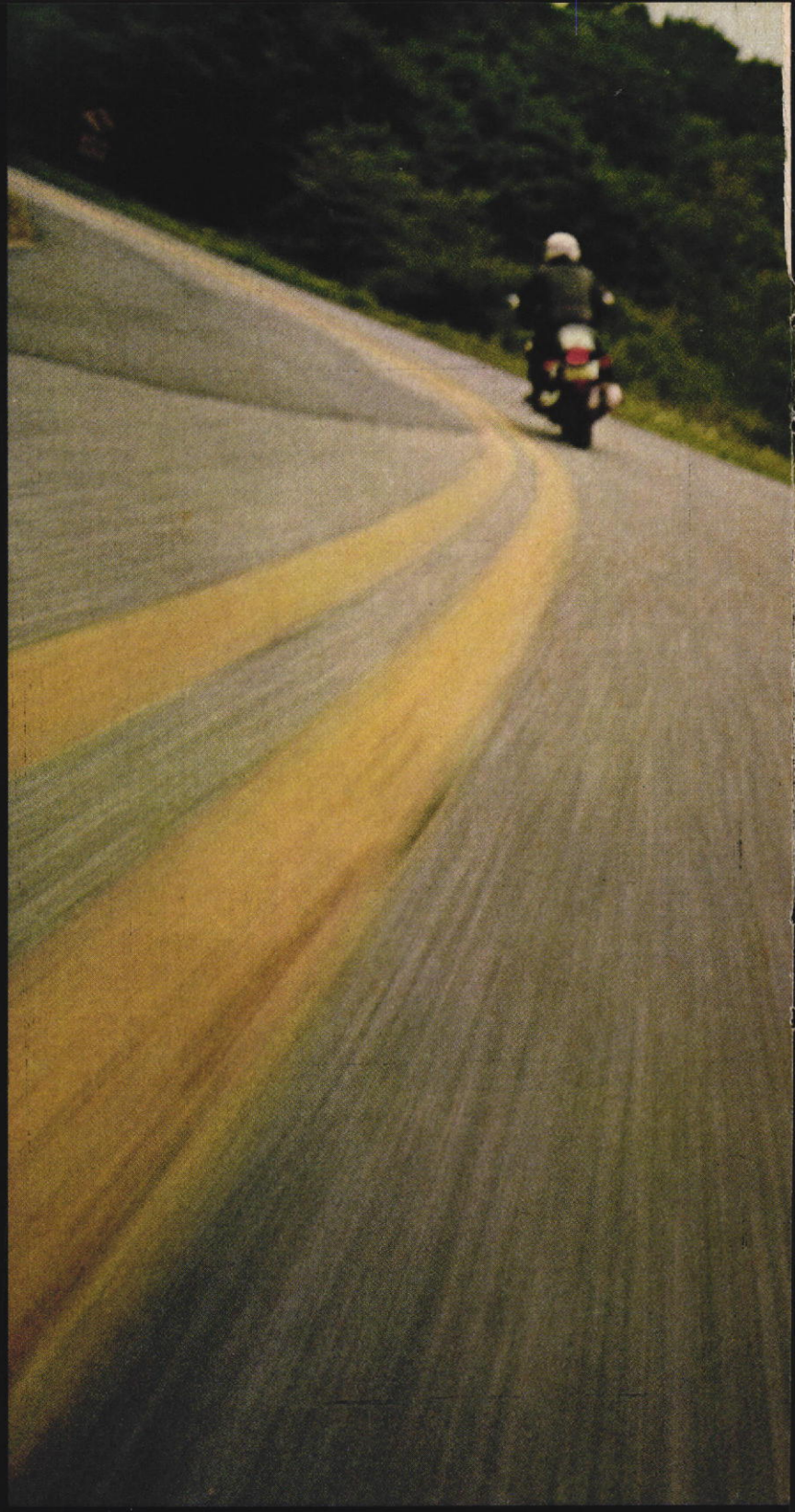
Primary/ratio	Gear/2.667
Clutch	Wet, multi-disc
Transmission	Constant mesh 5-speed
Gear ratios	1st 2.250, 2nd 1.684, 3rd 1.260, 4th 1.000, 5th 0.793
Final drive/ratio (sprocket teeth)	Chain/3.571 14/50

CHASSIS AND SUSPENSION

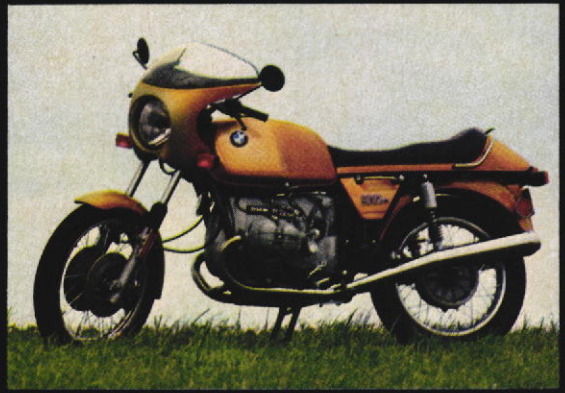
Frame	Tubular double cradle
Suspension, front	Telescopic forks 7.618 in. travel
rear	Monoshock 5-3/4 in. travel
Brakes, front	SLS
rear	SLS
Tires, front	3.00-21 Knobby
rear	4.60-18 Knobby
Rim locks, front/rear	1F, 2R

WEIGHTS AND CAPACITIES

Fuel capacity	8.0 Liters
Engine oil	Oil in fuel



"This BMW handles better than any bike I've ever tried. It's a cornering fiend. Ride one, and you're hooked."



With its flat twin engine and shaft drive, the BMW is different from most motorcycles.

It's not different to be different, mind you.

It's different to be better.

Take that flat twin engine, for example.

By concentrating the major engine parts low, the center of gravity is kept low. So the bike handles better.

The opposed twin design lets us use a 180 degree crank, so the pistons move in and out simultaneously. This makes a BMW uncommonly smooth.

Having the cylinder heads in the air flow ensures the BMW will always run nice and cool, too.

Placing the engine across the frame has another advantage. It allows us to run a driveshaft out of the back of the gearbox, a sealed-in-oil drive-shaft that is trouble-free. (And you know all the problems you can have with a chain.)

There's more to a BMW, of course, than its unique engine and shaft design. There's its incredible comfort. Its silky-smooth five-speed gearbox. Its powerful brakes. Its quartz halogen light. Even its 24 piece tool kit.

And for 1975, there's more still. Like perforated discs, new ergonomically-designed controls, more powerful electrics, new exciting colors, and an even more comfortable seat.

The BMW. It's different because it's better. Find out why. See the entire line of BMW motorcycles—the R60/6, R75/6, R90/6 and phenomenal R90S—at your local dealer. You'll find him in the Yellow Pages.

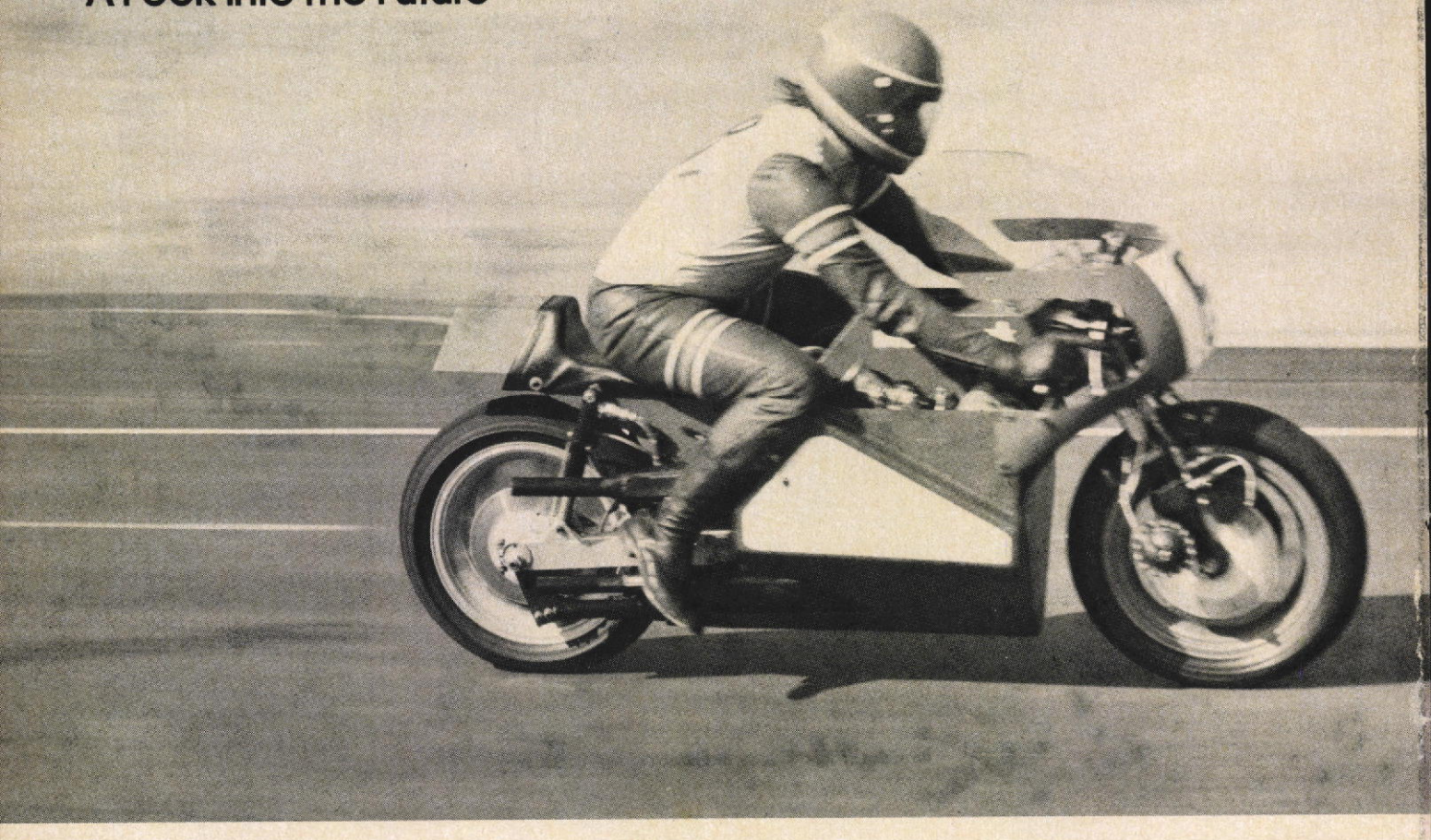
U.S. Importer: Butler & Smith, Norwood, N.J./Compton, CA. In Canada, BMW Motorcycle Distributors, Willowdale, Ont. European delivery plans available.

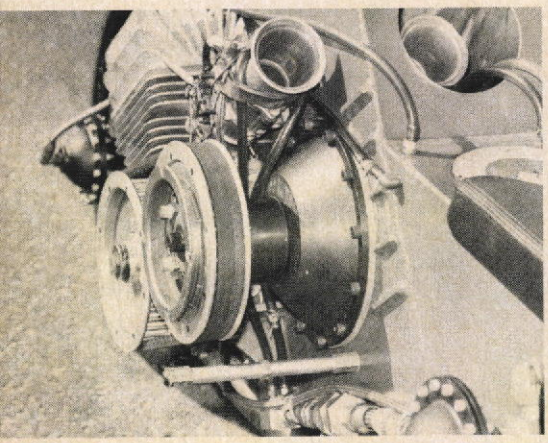
Bavarian Motor Works

50 years of building the world's finest motorcycles.

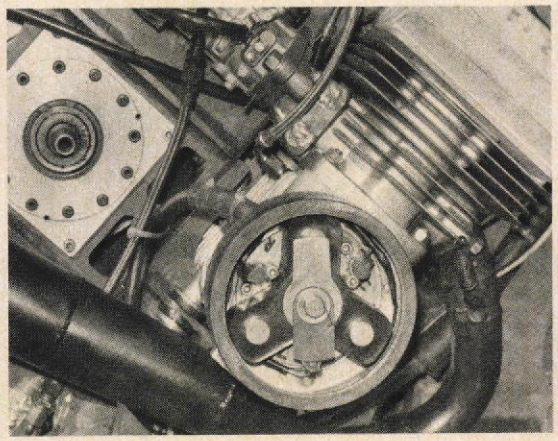
MONOTRACK MONOCOQUE

A Peek Into The Future

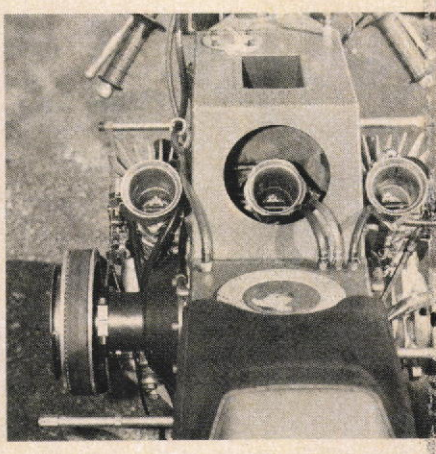




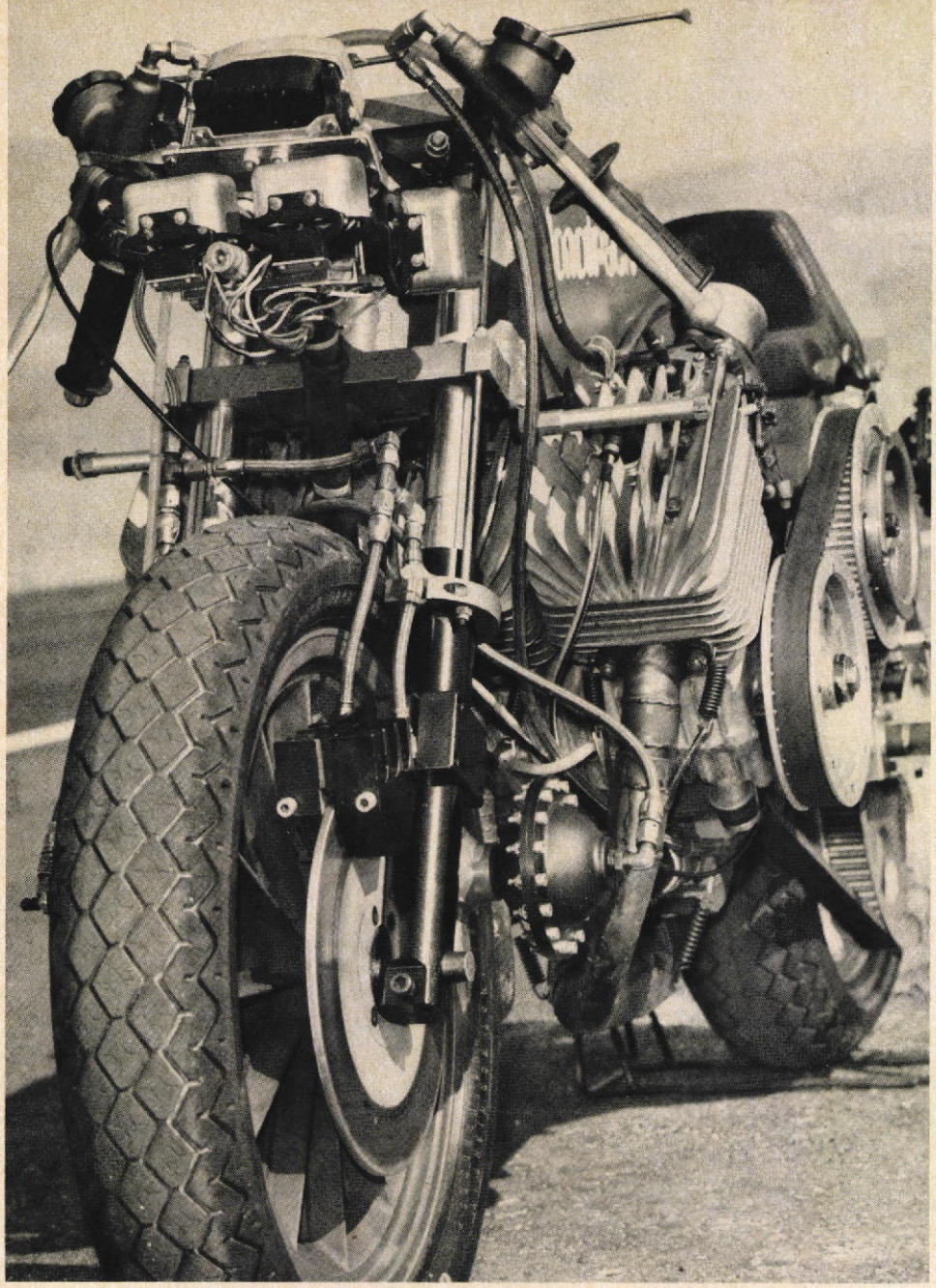
The drive to the torque converter is through a pulley/sprocket and Gilmer belt arrangement. Notice reinforcement around the mounting point of the converter.



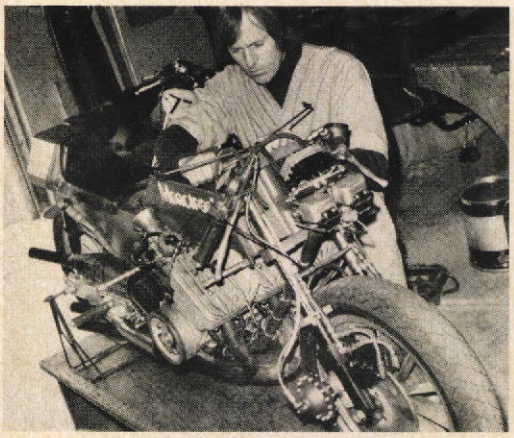
Ignition system is a proven Krober from Germany. Pipes have been cut and welded to get them tucked out of the way. New ones will be fitted before the bike is raced again.



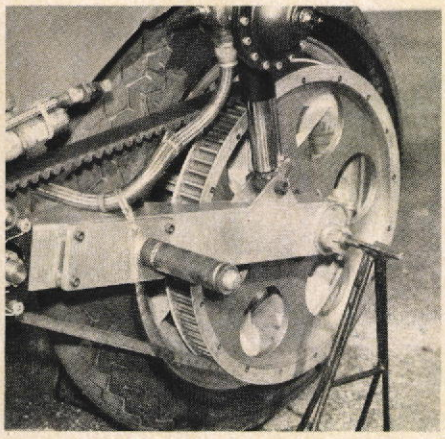
The three Tillotsen carbs as seen from the rider's view. The center section of the frame had to be cut to allow breathing room. Gas tank is in two sections with separate fillers.



From the front, the machine looks fierce with an abundance of hoses, cables and wires running here and there. Production model will have these routed through chassis.



The man and the machine. Dan Hannebrink makes some last minute adjustments to the steering head. Bike is extremely low but nothing hangs up. Production version will be fitted with 18"wheels.



Footpegs are mounted directly to the swing-arm. Peculiar while riding but not bothersome. Drive sprocket is almost as big as the rear wheel. Aircraft lines are to couple suspension.

by JOHN WEED

Innovations within the motorcycle industry are rare. This isn't to say that new things aren't popping up every year but they are more along the lines of improvements and modifications to existing designs and very, very few of them can be categorized as innovative. The obvious exception is the rotary engine which could be on the verge of revolutionizing the industry. Even if it doesn't, there is no doubt that it is a truly innovative two-wheel device.

While the major manufacturers have relied on four-stroke or two-stroke engines, tube frames, spoke wheels, normal suspension systems and multi-speed gearboxes for the past three decades, several small firms have been on the verge of breaking through the restrictions of the accepted norm and while many, if not most, soon fade into a semi-bankrupt demise, the odd few remain to keep niggling the industry into thinking that there is something more to motorcycling than hanging an engine between two wheels. Monotrack Engineering is just such a company.

Dan Hannebrink, the man behind Monotrack, is constantly exploring new outlets for his obvious design and engineering skills and his latest creation is the machine pictured here. To say that innovations abound would be an understatement with a magnesium monocoque chassis, torque converter shiftless transmission, air-oil suspension and 16-inch magnesium wheels heading the list. From there he goes on to break more barriers.

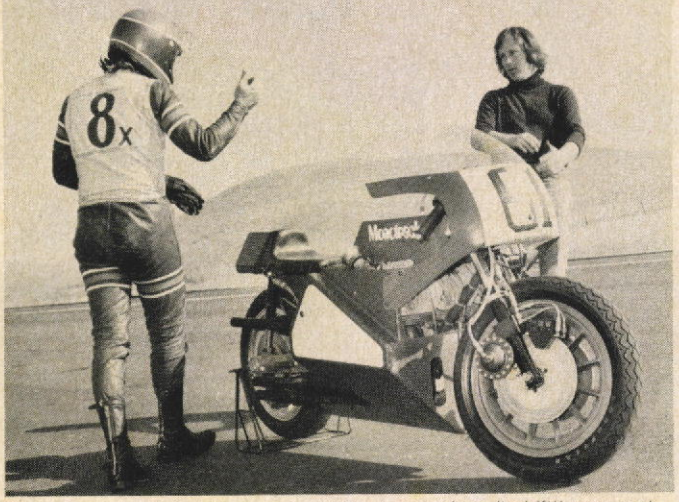
The motorcycle is more than just a design exercise as Dan has been racing it for the past year and a half in local California road races and while it hasn't exactly sent the 700 Yamahas scurrying away for a hp boost, it has shown that it can be competitive.

The machine took almost two years from drawing board to reality with the problems involved too numerous to list. Even now, with the bike relatively reliable, Dan is constantly experimenting with belts and converters in order to make the driveline more efficient.

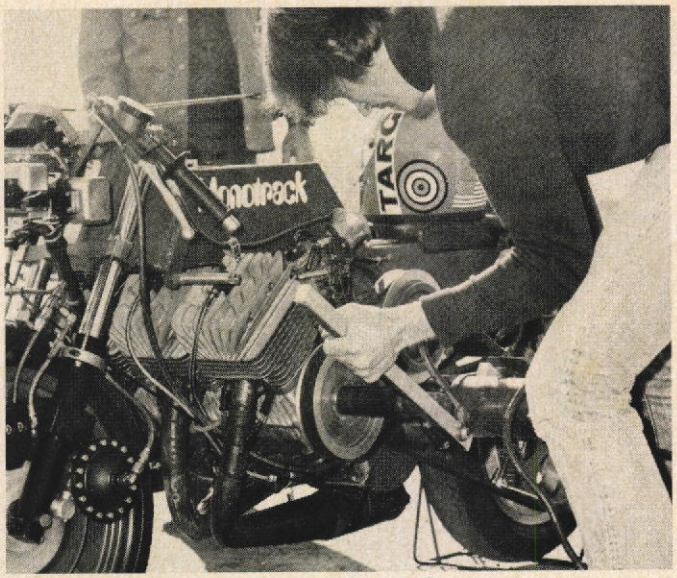
The motorcycle was conceived around the monocoque chassis and as Dan knew he was starting with something that wasn't proven, except in his mind, he thought he might as well go all out and construct the bike without being hampered by tradition.

Steel inserts are used in the steering head to handle the bearing chores but the rest of the chassis is magnesium plate, ⅛th inch for the side sections with the more critically stressed areas being ¼ inch. Wheelbase is 55" with the swing-arm being a massive looking, but light, box-section unit.

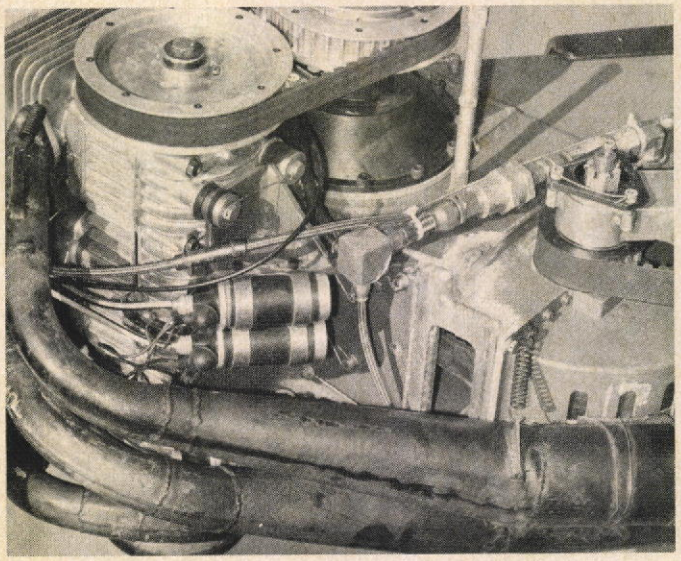
MONOTRACK MONOCOQUE



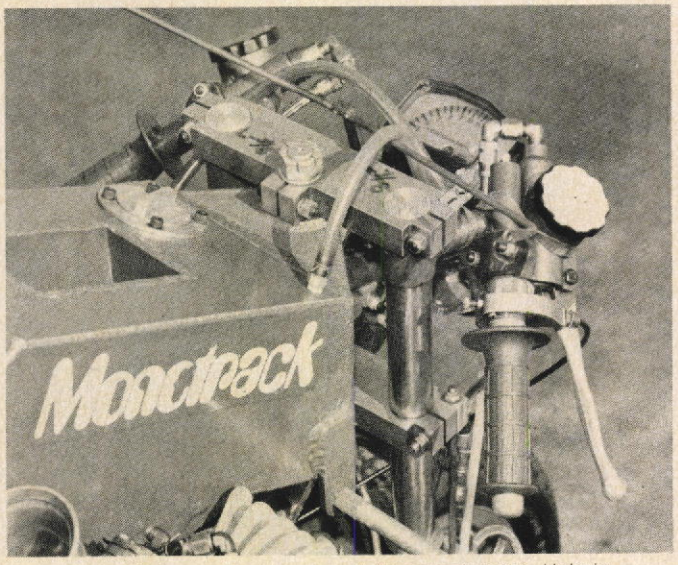
The author about to take a spin. "Which way does it shift" was met by a cold stare. Fairing looks cumbersome but initial tests show that Dan is heading in the right direction with it.



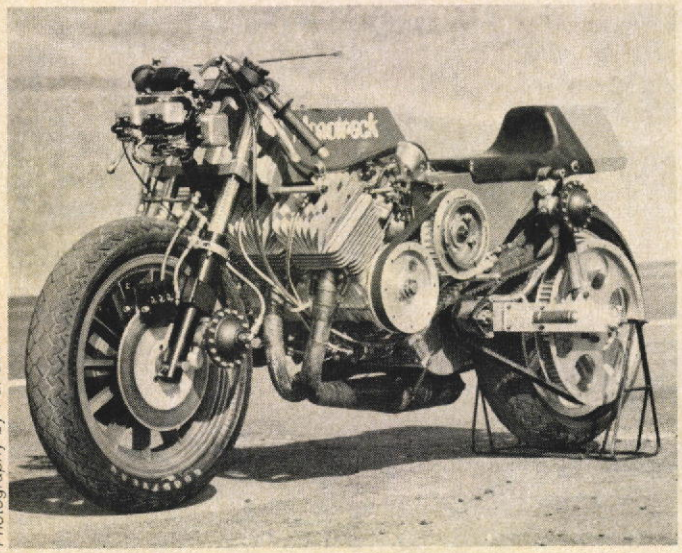
Although a rope starter is sometimes used, Dan has come up with a race car type electric motor. The production roadsters will have an electric starter. Notice spring mounts for pipes.



Bottom view shows coils, rubber mounts for engine and cooling vent in bottom of monocoque for converter. When racing, a scoop attaches to outside of fairing. Chassis is exceptionally strong and light.

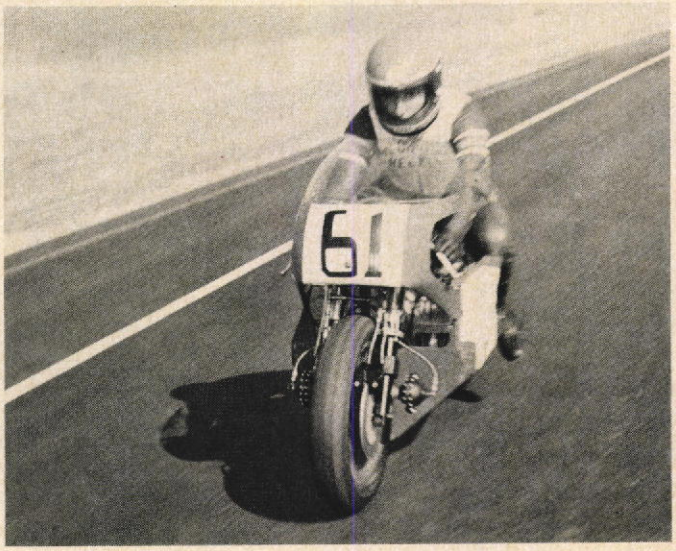


Fork crowns, forks and brakes are all Monotrack items. Hole in tank portion of monocoque is for cooling of center cylinder. Tachometer is Krober and the engine red-lines at 8500rpm.



Photography by Pat Brollier

Although the engine sits high in the chassis, the bike doesn't have a top heavy feel. In fact, seating position and general feel place it in the 250cc category rather than the open class.



Straight line acceleration is awesome although the sensation of wheelspin is not there. Bike is wide due to outboard torque converter drive and width of three cylinder engine.

Suspension is handled by Monotrack's own air-oil units that dispense with a spring to take up initial shock and uses a system of air and oil orifices to control both the damping and rebound. An added bonus on the rear units is that the damping can be controlled by a small knob while the bike is in motion.

Sixteen-inch wheels, shod with Goodyear road racing rubber, keep the whole package close to the ground and with an all-up weight of just over 250 pounds, the machine feels more like a 250. All of the breaking hardware – calipers, lines, pucks and discs – are Monotrack items that are sold for a variety of motorcycles and during our brief test ride, there was never a hint of lack of stopping power.

But while the chassis, wheels and suspension are novel and definitely keep the bike pointing in the intended direction, the engine/driveline is where the real interest lies. Hannebrink is convinced that an automatic type transmission is the best way to go for motorcycles. However, his reasoning goes beyond the ease of riding school of thought that is prevalent in the auto-transmission world and Dan is definitely thinking along racing, or at least sport riding, lines.

With a potent engine unit and a good torque converter, the power to the rear wheel is never interrupted and the engine is always working near its optimum output. The revs stay relatively constant while the only noticeable variation is the speed at which you are hurtling down the road.

Once Hannebrink came to this conclusion, he started to search around for an engine unit that would meet his needs and as he was dispensing with a conventional gearbox, he started looking into the snowmobile field, long a stronghold for exceptionally potent engine units and torque-converters.

The Kohler 650cc three cylinder mill was finally decided upon mainly for its basic design, availability and a claimed output of over 90hp. Although it is of conventional three port design, with nothing exotic in its internals, the Kohler proved to be more than up to the task. Bore and stroke are 2.66" x 2.36" and maximum power is delivered at 8500 rpm.

Pumper type Tillotsen 48mm carbs are retained although Dan has had to mount them upside down from their normal position. The stock Bosch magneto was replaced by a Krober transistorized ignition, mounted on the right side of the crankshaft. The coils have been mounted under the engine with the plug leads running up the front. The main reason for abandoning the Bosch was that it was mounted about three inches outboard of the outside main bearing and with that much rotating weight, crankshaft life was a little on the short side. The Krober, pirated from an H1-R Kawasaki racer, has proved ideal.

Transmitting that much power to the rear wheel has been the main cause of Dan's problems but he thinks that he has finally hit upon the right combination. A Salisbury torque converter was used until quite recently but that has been replaced by a slightly more compact unit from Comet. A Uniroyal Gilmer belt takes the power from the engine to the front portion of the torque converter by means of two external pulley sprockets. At present the ratio is 1:1 in accepted snowmobile practice but Dan is working on another arrangement here so that he can vary the final drive ratio by running a smaller engine pulley.

From the outboard pulley (sprocket) the shaft turns the drive portion of the torque converter which is hidden in the bowels of the chassis. The torque converter can be adjusted, by a series of weights and springs, to start transmitting power to the rear wheel at a prescribed rpm. When this happens, the rotating of the engine causes the weights to move outward within the converter by means of centrifugal force so that the center spacing of the pulley closes, forcing the belt to move to the

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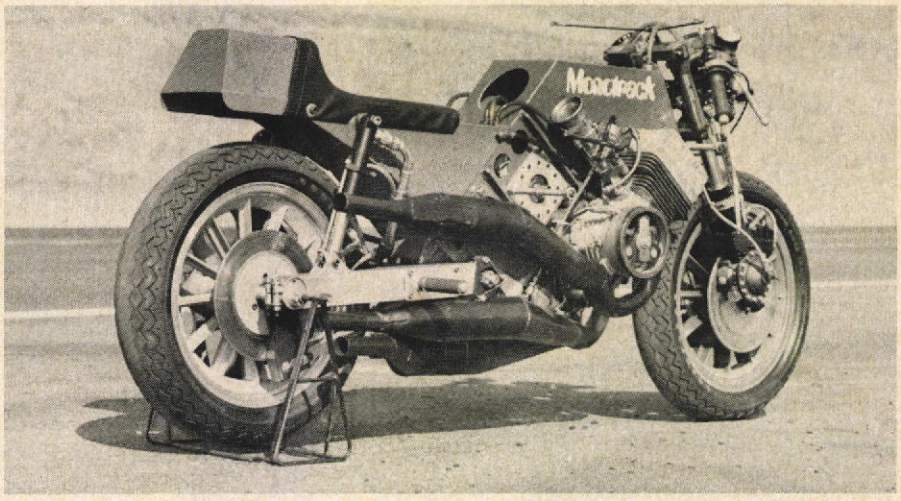
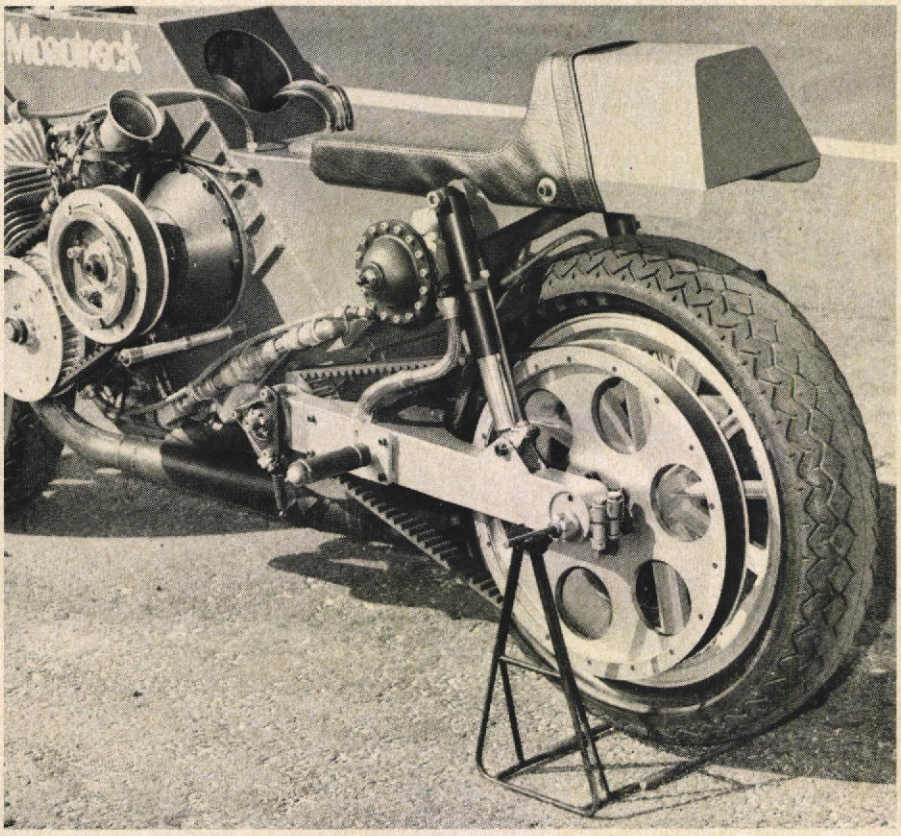


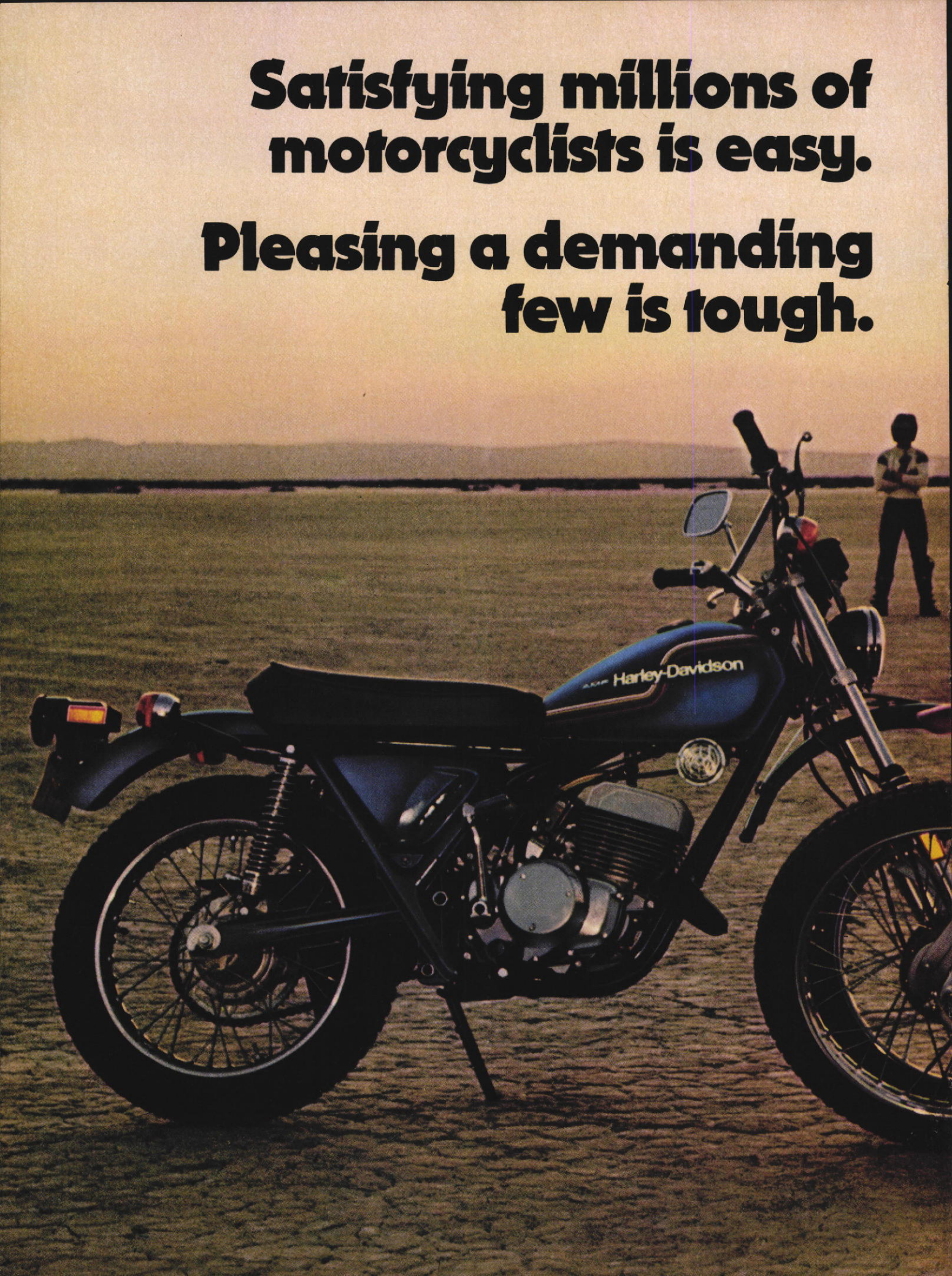
The three pipes exit from the right side of the machine but the production roadster and racers will have a different arrangement.



Sixteen-inch Goodyear road racing tire works well but as there is a shortage of 16" rubber available, Monotrack will go to 18 inchers.

Satisfying millions of motorcyclists is easy.

Pleasing a demanding few is tough.



It doesn't take a huge number of machines to satisfy the select few who appreciate something special. But they do have to be special. And the exciting new limited edition Harley-Davidson SX-250's and SX-175's are exactly that.

You'll see why when you consider the Harley-Davidson rider. Ever notice how he takes care of his machine? Ever wonder why he's so particular about keeping his bike as perfect as the day he bought it?

There is a very special way a Harley-Davidson owner feels about his bike.

And over 70 years of Harley-Davidson craftsmanship just might have something to do with making perfectionists out of enthusiasts.

At Harley-Davidson, quite simply, we're not out to please everybody. We're out to meet the requirements of a demanding group of knowledgeable, sophisticated riders.

If you're one of them—regardless of the kind of riding you do—you know precisely what we mean.

You may not need every feature on your SX-250 or SX-175 right now. But when you're ready, they're ready. Because they're already there.

That's the way we build motorcycles. For example, they have an ISDT quick detach rear hub. You won't be changing rear wheels often, if ever. But you might be in a race next Sunday, when seconds count.

And, while you're on pavement, the competition type front fork may not mean too much. Until you hit a chuck hole or until you decide to take to a trail.

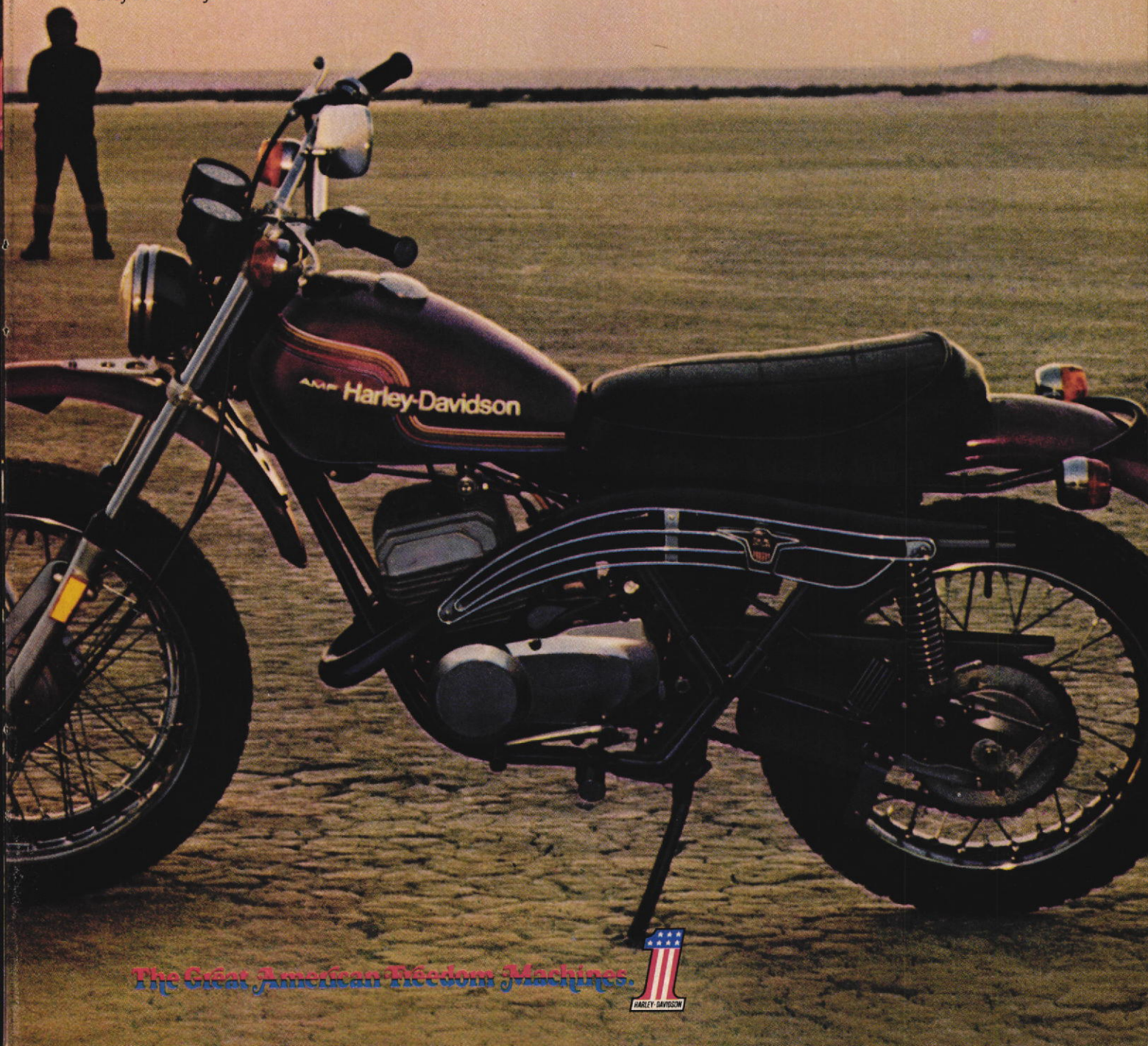
What in the world are you going to do with a resettable-in-either-direction odometer? Maybe nothing. But then you might be in an Enduro in the spring.

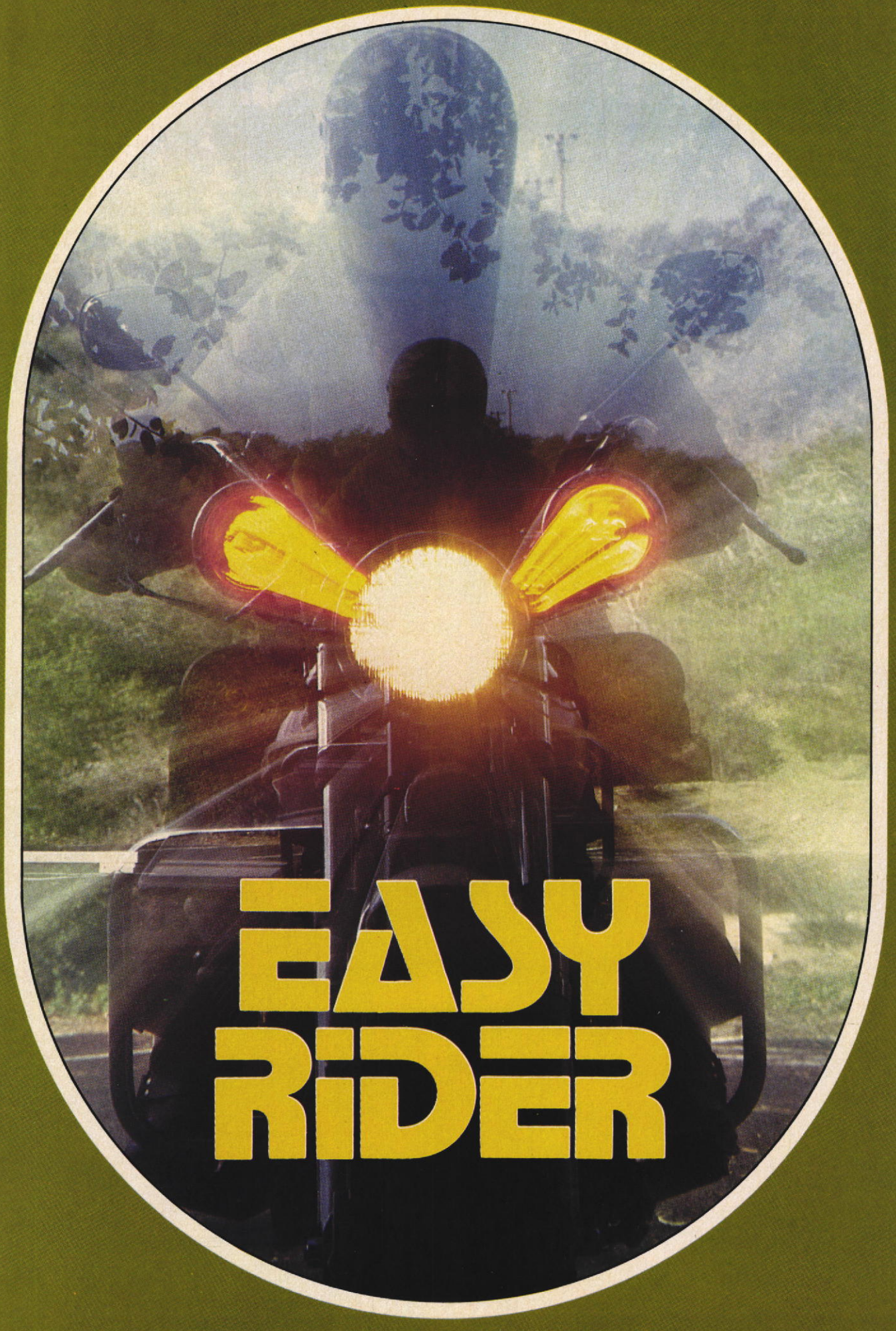
The Trials Universal tires aren't just there to create a sporty look. You'll know why we included premium rubber the first time you do serious dirt riding.

CDI ignition and oil reservoir within the frame are features you should know about but can forget about. Because the problems they eliminate will never come to your attention.

We take care of all the little things. For those who make a big thing about taking care of a bike.

AMF
Harley-Davidson




EASY
RIDER

Guzzi frees the slaves to lever shuffling with an automatic trans and coordinated brakes in their new 1000 V-twin

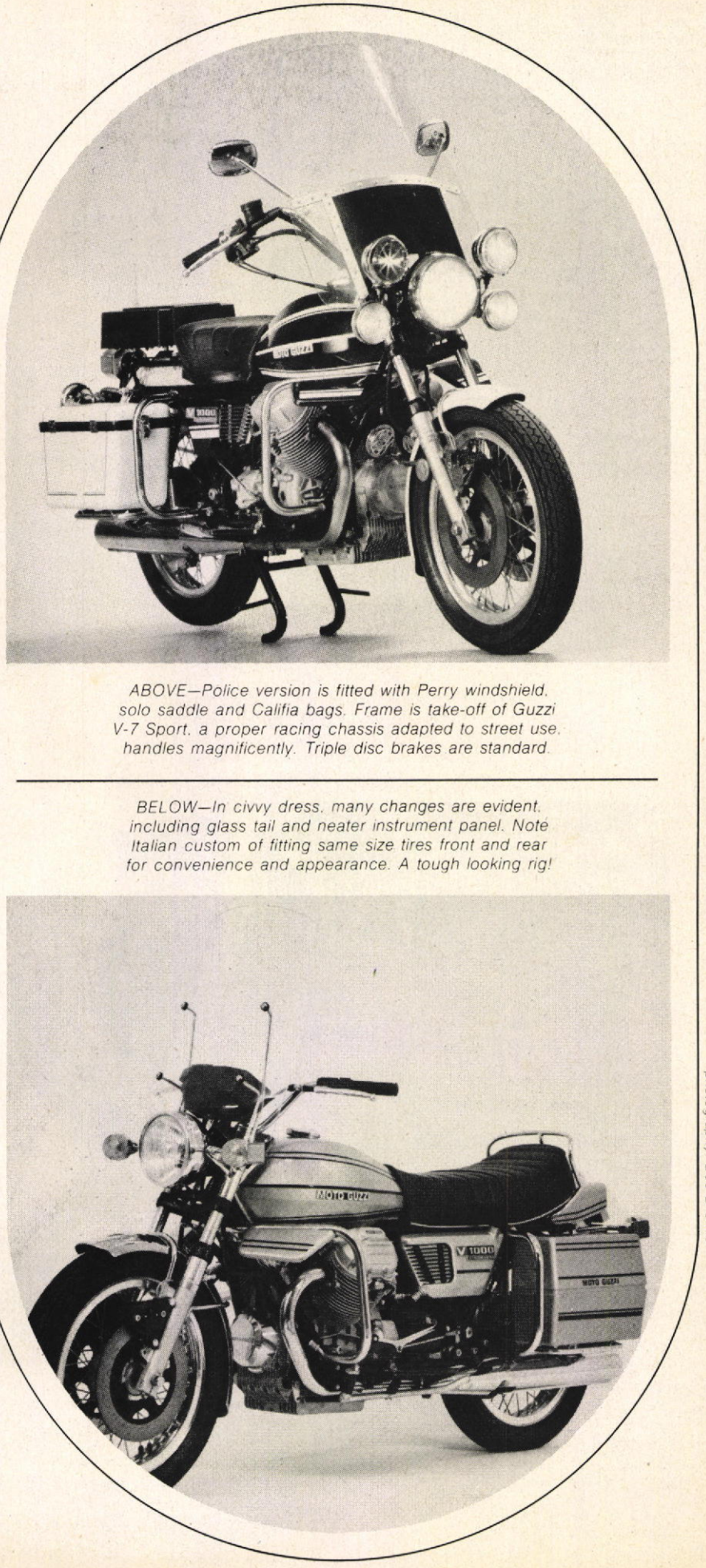
by Bob Greene

It's called State of the Art, and if we get completely honest with ourselves it must be admitted that except for engine durability, the disc brake and the electric starter, it's consisted of a virtual trade-off for the last quarter-century; exoticism for weight, performance for fuel economy, function for fancy. The Cylinders Game.

All of which makes it more remarkable that one manufacturer, a relatively small one at that, should break technological silence with not one but two truly fresh engineering concepts in a single year and model. To be expected was Moto Guzzi's displacement hike from 850 to 1000cc; it's the contemporary thing to do, raising horsepower to 71 at 6500 turns. But their startling disclosure of an automatic transmission *and* an interconnected triple disc brake system marks an uncommonly realistic awareness of something above and beyond mind-blurring performance.

Starting with the 1975 model line, the Guzzi rider will have the exclusive option of dismissing 60% of the manual operations necessary to command his motorcycle. For the revolutionary Guzzi 1000 can now be taken from standing start to full tilt and back to rest using only the throttle and foot brake, including every maneuver in the book. No longer need his attention to road and traffic challenges be detracted by concern with clutch lever, hand brake or foot shift. Although all three of these controls remain on the machine, their role is merely complementary, for only throttle and foot brake are needed to put the Guzzi-Matic through the most demanding chicane or even a fast stop. Operating only the throttle, standing-start quarter miles are achieved in 15.2 seconds at 88 mph, just one second and two miles per hour slower than a standard five-speed 850 Guzzi.

Deeply involved in police work, Guzzi's chassis development program is two-fold, to provide enforcement agencies a more stable and simple platform from which to perform their hazardous duties in optimum safety, while simultaneously benefitting the touring market urgently in need of similar considera-

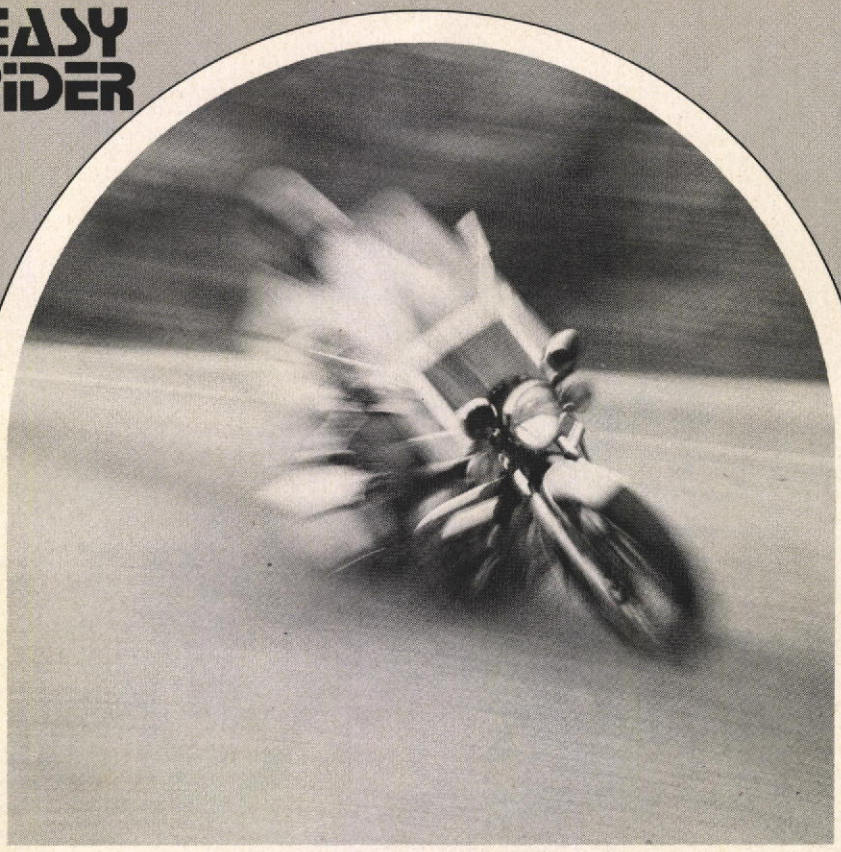


ABOVE—Police version is fitted with Perry windshield, solo saddle and Califia bags. Frame is take-off of Guzzi V-7 Sport, a proper racing chassis adapted to street use, handles magnificently. Triple disc brakes are standard.

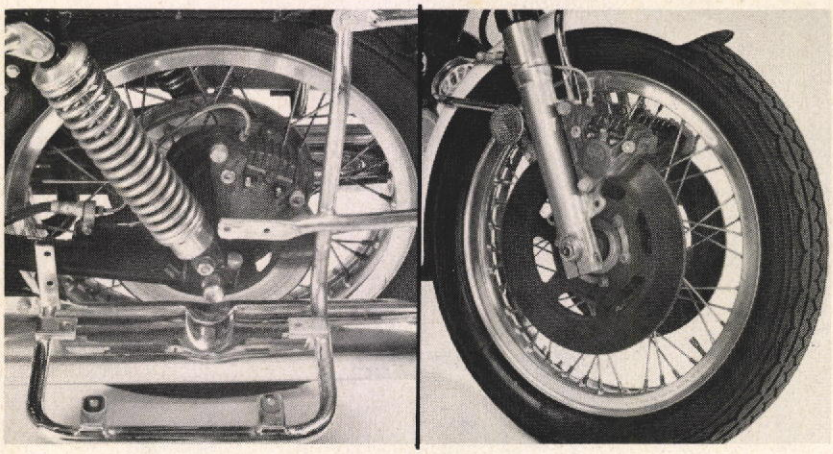
BELOW—In civvy dress, many changes are evident, including glass tail and neater instrument panel. Note Italian custom of fitting same size tires front and rear for convenience and appearance. A tough looking rig!

photography: Bob D'Olivo

EASY RIDER



ABOVE—That good Guzzi feeling in a corner lets this dresser charge with the funny bikes: grounding is no problem. Interconnected front and rear brakes still allow hand lever override of right front disc if desired. an industry first.



ABOVE LEFT—Shaft-driven rear end will feature Koni shocks. Brembo single hydraulic disc and those fine straight-pull spokes that seldom. if ever. require adjustment. Alloy 18-inch Borrani rims mount Metzelers.

ABOVE RIGHT—All the stopping power you could possibly want is found in Brembo dual discs: the left one getting 30% of foot pedal pressure and the right one taking its cue from the hand lever only. Spoiling the concept somewhat is too wide a lever span at the bar and lack of progressive take-up. nullifying sensitive control of right front disc. Let's hope Guzzi improves its lever geometry in production models.

tion. Because of the extraordinary nature of their work, law enforcement had been testing the Guzzi Automatic months prior to *Motorcyclist* Magazine being called in, explaining the official colors of the machine pictured. For this was the mount upon which we based our conclusions prior to future arrival of the similarly endowed but more colorful touring version. Although our test mule was heavier, with increased wind resistance and riding position unique to police work, it provided all the answers necessary to fairly evaluate the two new mechanical systems.

So neatly packaged is the 1000 engine and automatic that even the confirmed Guzzi fan will require a double-take to spot the shiftless one. Only extremely minor outer casting mods—not larger, just slightly different—in the gearbox case are evident, after it is pointed out. Although the clutch has been retained, a hydraulic torque converter, backed up by a two-speed reduction gear, takes place of the original five-speed gearset. A torque converter is simply two facing multi-blade vanes, or fans, in a sealed drum of oil. The engine-powered front vane moves the oil which in turn applies hydraulic pressure to the rear output vane, thus motivating it to turn in unison. The two-speed gear provides high and low ranges for optional use, with engagement made through a mechanical lever and conventional clutch. Low range, for example, might be preferred for extended tight mountain work or heavy traffic; engagement can be made on the run with a flick of the clutch. Low range, naturally, provides more responsive acceleration and is good for up to 80 mph. After the novelty wore off, however, I found high range perfectly acceptable for mountain or megalopolis and left it there for the duration.

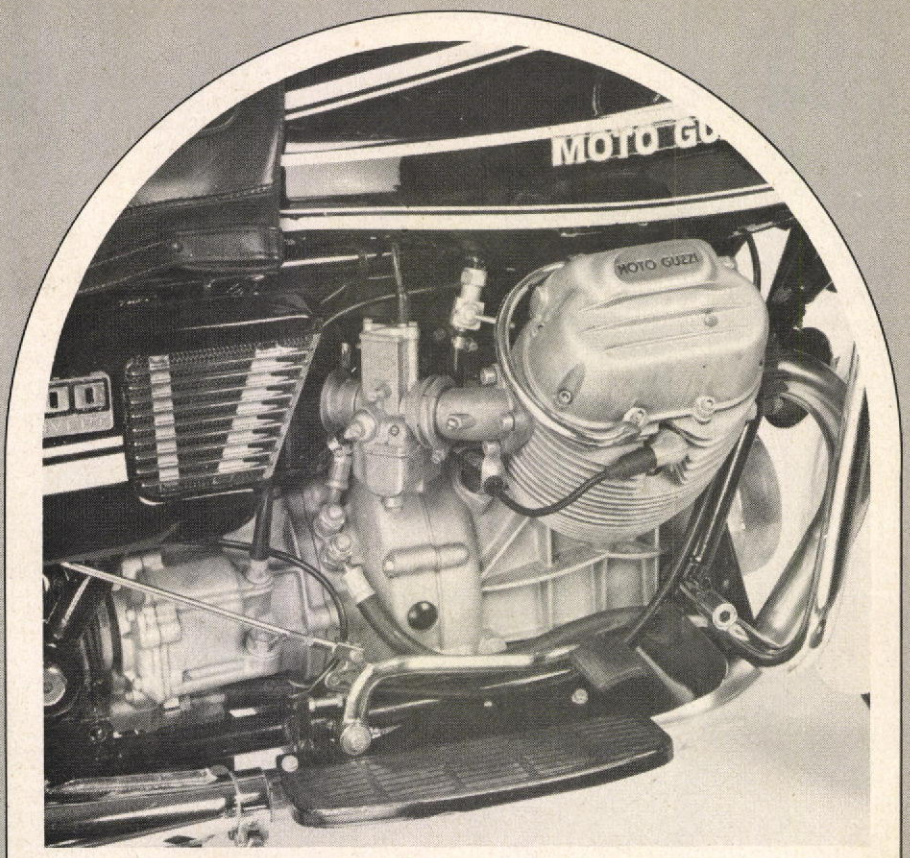
What does it feel like? The revs come up considerably higher than a conventional box upon moving off the mark, quickly leveling out as momentum builds to what feels to be full lock once the machine is up to speed. Noticeable at first, the rider soon becomes accustomed to the different sensations of sound and movement. An average start requires more throttle than normal, and until such time as the novice becomes acquainted with this characteristic he is apt to waver slightly coming off the line. Once acclimated, however, straight, hard shots are in order. In fact, coming up to speed with the Automatic is smoother since it is not accompanied by the usual wiggle and lurch occasioned by engine speed change, driveline disengagement and body movement of a conventional shift. Acceleration is deceptive; since the engine never peaks but, rather, seems to be holding a relatively constant speed, the Automatic is difficult to relate to a contemporary mount until you start

counting telephone poles. Which is to say it is getting away faster than it lets on, as confirmed by the aforementioned quarter-mile figures. The picayunish may mention the slight transmission whine that accompanies deceleration. Noticeable primarily at first, it, like any sounds peculiar to a foreign power concept, soon becomes accepted as a part of the package—reminiscent of my first trip at the helm of Chrysler's turbine car and Sachs' Wankel bike. Virtually no engine braking is evident upon deceleration, a characteristic which, contrary to personal preconceptions, went unnoticed until the occasion of preparing notes for this feature—all the more tribute to the triple disc braking system which we will get into shortly.

The question of power loss—efficiency—through the torque converter was anticipated, but since the 1000cc engine is unprecedented in the Guzzi line, we can only relate efficiency to contemporary performance and fuel economy. Accordingly, the transmission seems to grip pretty tight, if 42 miles per gallon at a steady 65 mph on level freeway is any indication. Hey, with the standard 6.6-gallon tank, that's a 277-mile range! Pushing the Goose hard over a squirming 5000-foot mountain, mileage dropped to 32 mpg, still respectable considering the throttle was buried most of the time. These figures, incidentally, are the result of corrections made according to California State mileage markers, the odometer being over half a tenth (.06) happy in a true mile. Before correction, they indicated 44.6 and 34.1 miles per gallon respectively. So for comparison purposes you can take your choice, depending upon whether they are being related to a standard optimistic odometer or one that has been submitted to the lie detector.

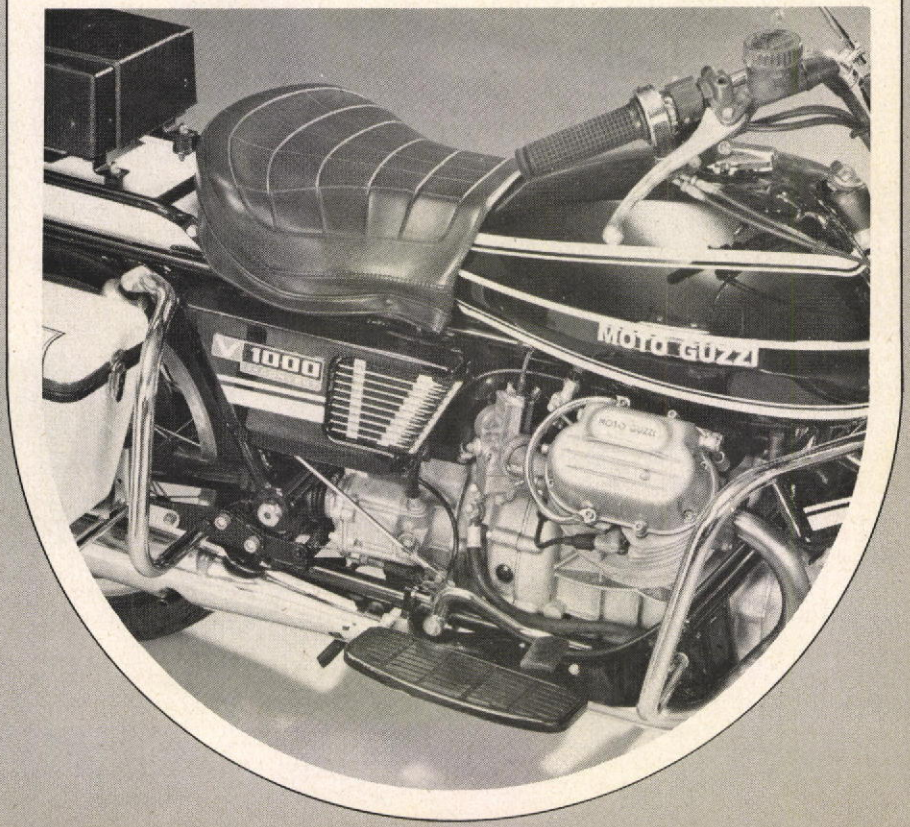
Now, when do you use the clutch? Only when starting the engine. Crack the ignition, disengage the clutch, hit the starter button and slowly release the clutch, with light application of the front brake for initial restraint; from that moment on, as long as the engine is running, it requires no further use. Unless, as mentioned, the operator opts to change from high to low range or vice versa. Disengagement also frees the running engine from the drivetrain and makes it easier to roll the machine backward should it be momentarily necessary in traffic or when maneuvering to park. It is possible to back up with the engine running and drive engaged, but it is easier using the clutch. Of course you drag racers are hep that the clutch could improve your e.t., bringing the revs up with it held in and dropping the hammer just as the light goes green, but you won't find this sneaky technique in the handbook.

It was over "my own personal"

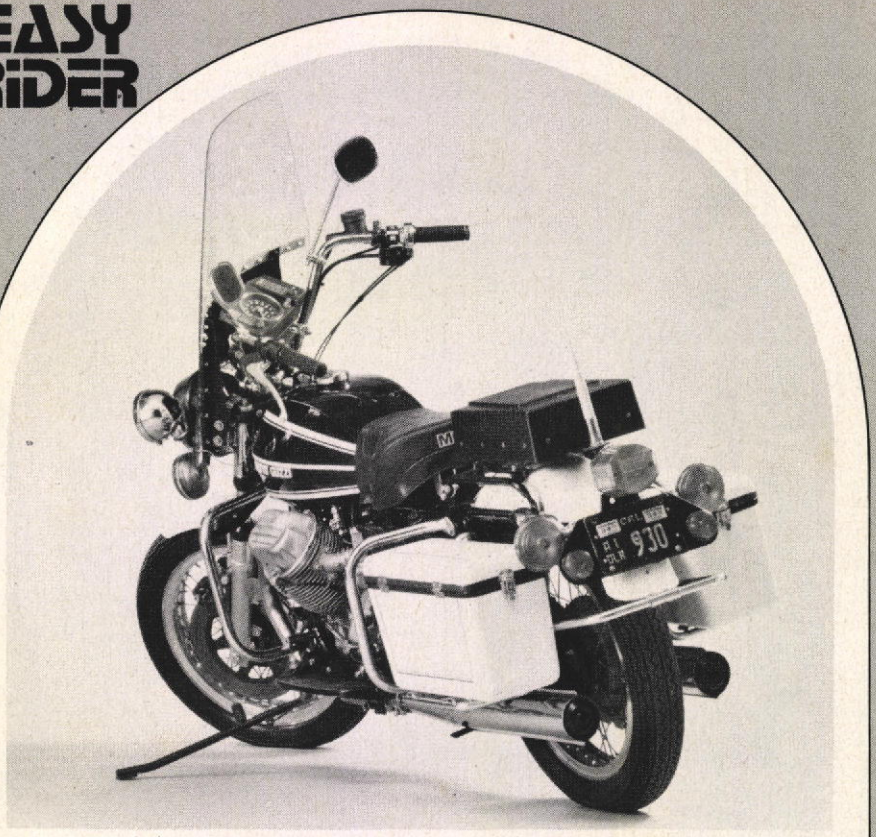


ABOVE—Torque converter is sandwiched between clutch and two-speed gearbox. Two hydraulic lines are visible from outside: by means of a pump on the end of the camshaft, oil is circulated through cooler that doubles as crashbar.

BELOW—Yes, even the civvy model will sport floorboards. They do allow considerably more freedom on a long tour. Extra muscle of the 1000 engine—actually 949cc—was gained by increasing 850's bore from 83mm to 88mm.

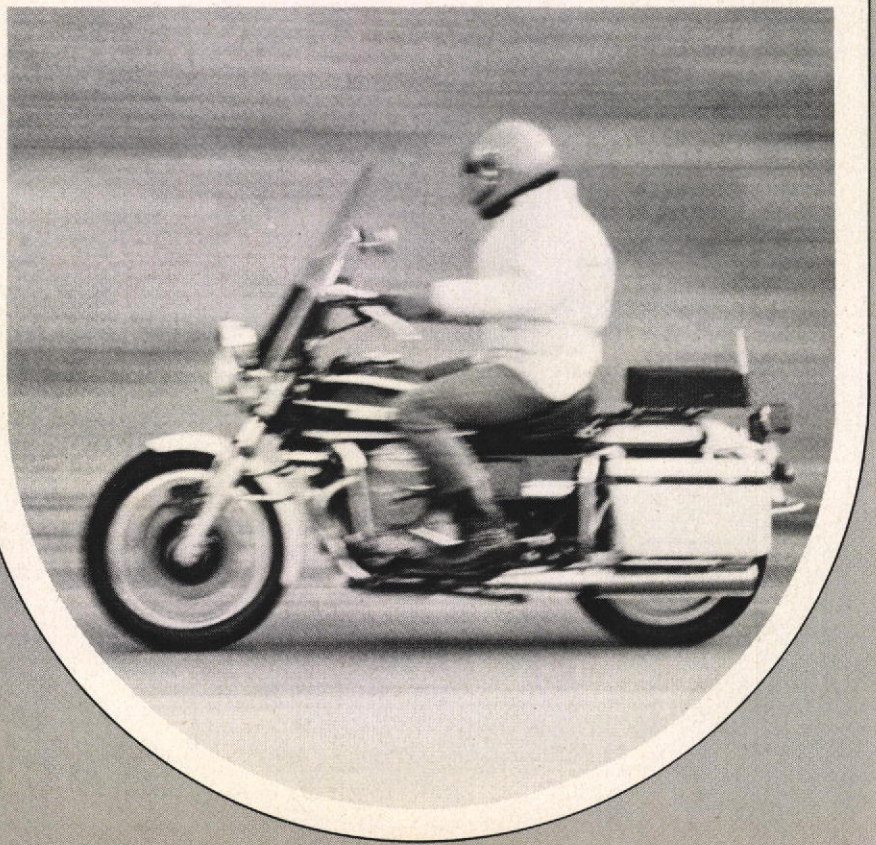


EASY RIDER



ABOVE—With the sidestand out, the ignition system remains inoperable since it bears on a cutout at the pivot. It also actuates the rear brake when in the fully extended position, serving as an automatic parking brake—trick.

While the others are going ape on high-revving and exotic engines, Guzzi stays with their easily-maintained, automotive-based engine and pioneers untilled fields of chassis development. It's a smart move: they're all alone.



mountain pass, averaging 61 mph, that we decided Guzzi's coordinated dual disc brakes merited touring acceptance. The brake pedal hydraulic line is plumbed into the rear disc and the *left* front disc, with valving so sized that 70% pedal pressure is fed to the rear and 30% to the left front. The right front disc is completely controlled by conventional hand brake lever and brought into play at rider discretion, if and when he feels he can improve on the interconnected system. Of course I had to try to lock the brakes, using only the brake pedal, on dry pavement and again during a light drizzle; in each instance the rear disc started to get rubber before the front. The percentage of force distribution is dialed in to where it is virtually fool-proof, probably providing all but the most accomplished handler a more consistent if not faster stop on most occasions. Only in loose gravel did the front end want to skate. To suit all preferences, however, production models will be fitted with a disconnect valve in the line which will permit the owner to disassociate the left front disc from the rear brake pedal if he so desires, allowing it to be plumbed into the hand brake lever for conventional control over both front units. But it is doubtful that separation of front and rear will be desirable under any circumstances come May 1, 1975, proposed Stateside arrival of the first shipment of 1000cc Guzzi-Matics. For they are scheduled to include a revolutionary anti-skid device that will prevent either wheel from locking under any circumstance. Still another industry first, this promises to markedly reduce accidents on not only dry pavement but in rain, ice and oil especially. Can you imagine roaring up to a full-stomp stop on loose gravel without so much as a quivver?! Unfortunately our early test precluded evaluation of this compensating mechanism, but be assured that when it arrives you will be the first to be apprised of this fascinating contribution to rider longevity. If ever a national safety award was in order, now's the time, Guzzi's the one.

Other than freedom from shifting and clutching, what are the advantages of the Automatic? You're caught in heavy traffic on a steep hill, maybe riding two up, the light at the top turns red and you are trapped in the unenviable position of clutching-off a heavy load without stalling or ramming the car behind. It's nothing with the Automatic; sit there with both feet down, no brakes on, loading the tranny just enough to keep the rig from rolling back. Come time to move out, just feed in throttle and steam smoothly away. Or you've probably had occasion, when maneuvering slowly in traffic or even getting into a mountain bend, when it seemed advantageous to crowd the throttle in

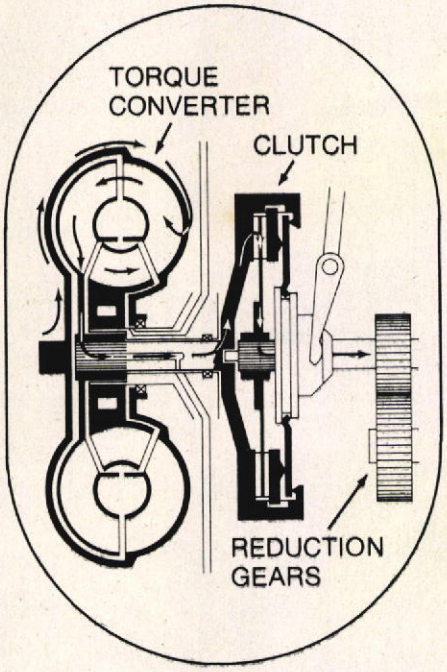
unison with the brake for a second to keep flywheel speed up for instantaneous recovery upon release of the brake. Awkward on a conventional gearshift job, the technique is a natural with the Automatic since the slippage factor in the torque converter, when restrained with the brake, allows engine momentum to rise higher than can otherwise be maintained, actually enhancing control on certain occasions.

Still another subtle but sizable advantage of the Automatic is one long proven in the automotive world, its cushioning affect on the entire engine and driveline. This liquid buffer between crankshaft and rear wheel softens each power impulse to every gear and bearing and, likewise, back the other way when radical changes in tire adhesion tend to bite the backside of the gear. With the advent of the automatic transmission in the automotive world in 1939, driveline breakage and wear were reduced a surprising extent; now Guzzi will enjoy the same increase in longevity, including rear tire mileage.

I won't attempt to "sell" you on the Automatic concept; it's one of those decisions an enthusiast can only make for himself. Some will think it's the greatest thing since the electric can opener; others will feel that it is oversimplification, that one of the attractions of a motorcycle is the mastery of its many controls and the personal satisfaction and identity achieved in their playing. The Guzzi-Matic does, however, offer a great deal for the man who spends a lot of time in the saddle and who wants to devote even more concentrating on his surroundings than shoving levers back and forth.

The Guzzi-Matic 1000 is a dramatic gesture on behalf of importers Joseph and Michael Berliner to the touring rider. For this is a full-dress rig comparable to Harley's King of the Highway concept, available with top-flight accessories such as the bullet-proof—really!—Perry windshield, touring floorboards, crashbars, Califia saddlebags and auxiliary lighting. New generation hand switches are standard. The big motor and coordinated brake system are presently exclusive to the Guzzi-Matic. While our test vehicle ingeniously circulated transmission oil through the front crashbar as a cooling expedient, it will be rerouted via a more conventional front radiator in production to reduce vulnerability in the advent of a fall. The tiny rectangular, front-mounted airfoils will be retained, their implied contribution being extraordinary front-end stability at speed. Additionally, the 1000 will be distinguished by a fiberglass tail fairing and license assembly unique to this model.

The Berliners are to be congratulated, not only on getting this roadster together but also on the exceptional quality and appearance of the accessories which they offer. The ⅛-inch-thick Lexan windshield made by John Perry of Perry Aeromotive is an absolute life-saver. Not only does it turn the wind with flutter-free defiance at 100 mph, it turns pretty fair caliber bullets aside as well, and you can't break it with a sledgehammer! Guzzi rates the Automatic at 106 mph with windshield. Fitting Harley-Davidson as well as Moto Guzzi, the super-tough Lexan material is not to be compared with conventional plexiglass; Lexan does not splinter or crack even when a body is thrown against it in an accident, it only bends and returns to normal configuration. To prove its toughness and resilience, Perry built a cross-bow capable of firing a half-pound steel ball through ten layers of plexiglass. When turned on his Lexan shield, the ball merely bounced off without so much as a sign of impact remaining. Rocks thrown from large truck wheels don't even challenge it. As stated, it is virtually bullet-proof in the true meaning of the word.



Unlike conventional machines, should the engine seize, the Automatic's converter pump stops turning, bike coasts smoothly to a halt without skidding.

Since the Guzzi-Matic will be carried in the new Interceptor frame, it appears that the old longer and heavier El Dorado frame will at last fade from the scene. Don't mourn it, for the late chassis, a take-off on their Sport frame, is race-proven, tighter-knit, even more flex-resistant and defies grounding. Combined with the latest wide-face Metzeler road race tires, it is a superb example of European expertise. Roadholding and suspension are tuned to inspire complete confidence straight-on or at any angle of bank, making light of awkward road irregularities at the most inopportune times. Koni rear shocks and Marzocchi five-inch forks are utterly forgiving and yet taut in their control, a rare blend of spring rate and valving. Where the old Guzzi chassis chipped the macadam rather easily through a fast sweeper, the new frame and pegs are high off the deck, without threat of hang-up even with your tootsie aboard. Easily it is one of the very finest roadsters of the day, far ahead of the norm and capable of outcornering most of the so-called Cafe Racers in its full touring regalia.

Although *Motorcyclist* came in in the "middle of the movie" so to speak, before Moto Guzzi had finalized all of the trick hardware for the 1000cc Automatic, we couldn't resist the opportunity to break the news on their innovative transmission and coupled brakes, and must now be content to merely verbalize on some of the lesser but interesting appointments programmed to catch up by assembly line time. For example, the rear brake will be operated by the sidestand when the stand is in the parking position, to preclude possibility of the bike rolling off the prop. Similarly, wiring circuitry will prevent the electric starter from coming alive while the sidestand is in the down position, as indicated by a warning blinker. All four turn signals can be switched to flashing warning lights in case of roadside emergency. There will even be a fuel level indicator and brake pad wear gauge. And the 1000 will, happily, incorporate the Guzzi Sport's automatic fuel petcocks, which are electrically activated and deactivated by the ignition switch. So you don't have to put the Guzzi to bed after parking, just pull the ignition key and walk away. For the forks also lock automatically when the key is removed. They are even including a courtesy light! And at long last the factory has listened to the Berliners' insistence that all Guzzis be equipped with a disposable cartridge-type oil filter.

Perusing several detailed reports filed by various law enforcement agencies subsequent to stiff and lengthy tests involving acceleration, high speed, cornering and braking, it is obvious that the boys in blue are ecstatic over the revolutionary driveline and brake concepts. Handling and braking efficiency, especially from high speed without fade, seemed to delight them the most. Some recommended that the two-speed shift lever be changed to the left side and converted to foot control to facilitate operation during a chase and this, too, is being handled on the production model. One officer called it the "Ultimate Tool," which, literally translated, must come out something like "One Helluva Scooter." To which I might only add, Right-on, Your Honor! •

"Don't tell anybody I told you, but the DT400B is the best big-bore Enduro around."

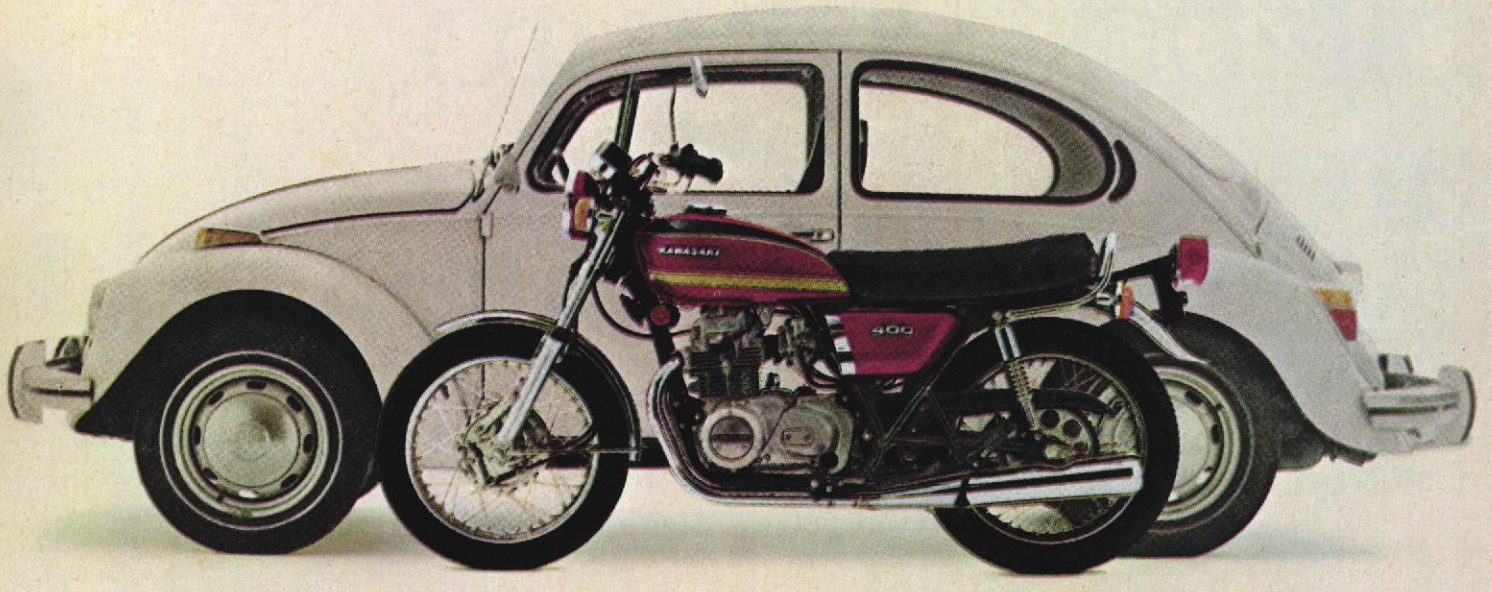
"My name is George Elliott. I'm a test-rider, motocross racer, and editorial director of Popular Cycling Magazine. I wouldn't want this to get around—I have a reputation of being a very tough critic—but I came away from riding the DT400B saying things like "great" and "terrific."

"The DT400B has the best enduro engine that I've ever tested. The engine literally pulls like a locomotive. Low speed and mid-range performance is phenomenal—which means that you can climb fearsome hills and plow through tough terrain that you just wouldn't try with other bikes. On road, this bike will give you all the speed you need and then some! It handles well, brakes well, and like other Yamahas, it'll wear well.

"If it were my money (and I didn't take a nickel for doing this ad), I'd buy a Yamaha DT400B, the best big-bore on-road off-road bike around."

"I'd buy a Yamaha."

Someday you'll own a Yamaha.



Think even smaller.

Some 20 years ago the idea of thinking small to beat the high cost of transportation turned a lot of heads around. And rightfully so. It was an idea whose time had come.

But, today even thinking small can cost you plenty (we don't have to tell you about inflation).

Today it's timely to take 'thinking small' a step further. Now it's smart to think even smaller. About the size of a Kawasaki motorcycle.

Compared to car costs—price, mileage, and maintenance—a Kawasaki will let you ride through inflation without bending your budget out of shape.

Besides, on a Kawasaki we think you'll have a better time getting where you're going. During rush hour, on a weekend country ride, or a spin around town.

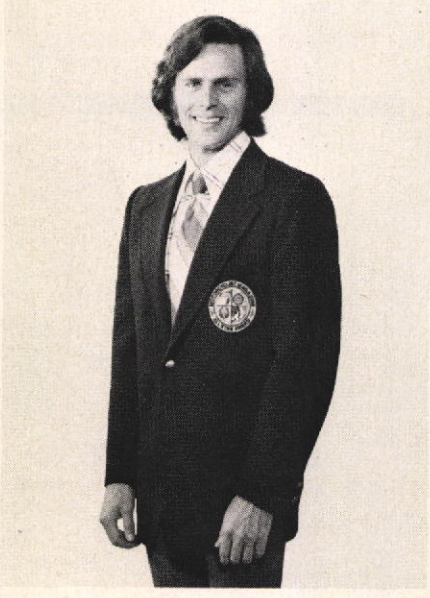
So size-up a Kawasaki. By thinking smaller you'll get yourself low cost transportation and plenty of good times to boot.

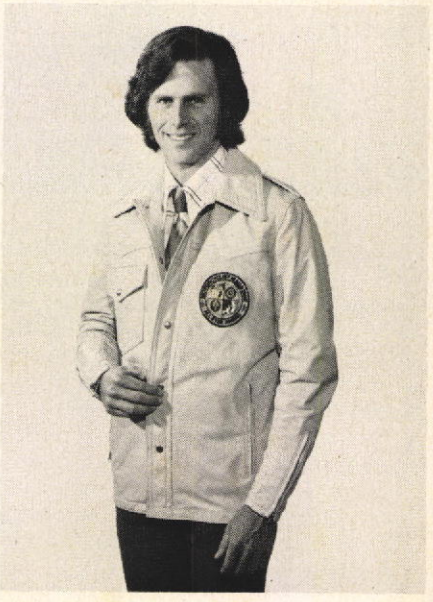
In times like this, that's some bargain.

$995*
Kawasaki
lets the good times roll.

Good times include riding safely. We recommend wearing a helmet and eye protection, keeping lights on and checking local laws before you ride. See Yellow Pages for nearest Kawasaki dealer.
*Shown is the KZ-400/Special. $995 manufacturer's suggested list price excluding freight, dealer prep, state and local taxes. Price subject to change without notice.

ALL STAR REPORT





Motorcyclist Magazine All-Star Awards, an on-going program conceived to honor the outstanding men and women of our sport as reflected in your eyes, comes of age as the second annual program draws to a close. The ballots—27,843 of them—raced under the wire and now only remain to be counted. From them, the winners in 18 popular catagories will be determined and announced in next month's issue of Motorcyclist, following the Awards Banquet at the Americano Hotel in Daytona Beach.

In only two years this Awards program has achieved unprecedented acceptance and acclaim, not only from the inner circle of enthusiasts and manufacturers but those looking on from the outside as well. For although our sport serves as the nucleus of the Awards, the purpose—the ultimate goal—is the upgrading of prestige through public awareness and recognition. Being good is not good enough; our champions demand greater rewards, a sense of fulfillment that can only come from total acceptance.

But in nearly three-quarters of a century, that big happy face never smiled on the motorcyclist. As far as the public was concerned, he was just around when they wanted him. It's going to be different now. More apropos, the All-Star Awards might have been called Operation Bootstrap, for it is defying the laws of circumstantial gravity, slowly but surely elevating motorcycle achievement to the wordly level it rightfully deserves.

Involvement is the key word; through the magic of the media you have proven that you were ready for it all along, as have the sponsors of the awards shown below. They've been behind you from the beginning—good names to ride with. And now, the winners are . . . •

Sponsors

Bates Industries	Leather jackets
Bell Helmets	Tote bag
Bel Ray Lubricants	Drinking glasses
Circle Industries	Track jackets
Goodyear Rubber Company	Decals
Hurst/Hallcraft's	Blazers
Koni Shock Absorbers	Clothing bags
Pennzoil	Parkas
Scott Goggles	Sport shirts
Sperex Company	Bike covers
Torque Engineering	Visors
Webco Engineering	T-shirts
Yankee Motors	Medallions & plaques

MC BUYER'S GUIDE:
OFF-ROAD PANTS

16622 West Rogers Drive
New Berlin, Wisconsin 53151
MODEL: SpaceMan MX
COLORS: Red w/white stripes
Red w/yellow stripes
Black w/yellow stripes
Green w/white stripes
Blue w/yellow stripes
Black w/red, white and blue stripes
MATERIAL: Leather
SIZES: 28/30/32/34/36
FEATURES: Stretch nylon lining; double thick, double stitched seat.

WHEELS OF MAN

Just as moto-cross requires some very specialized motorcycles to withstand the rigors of competition, the moto-cross rider has an increasing amount of specialized protective clothing to insure that he finishes at least as well as his bike. For his riding safety, he has available helmets, goggles, gloves, mouth protectors, chest protectors, boots, elbow pads, kidney belts and pants with hip pads, knee cups and shin protectors (with apologies for any part of the anatomy left out). This month's Buyer's Guide will focus on off-road pants as one of the most neccessary and rapidly changing parts of the rider's protective clothing.

Originally made exclusively of leather, today's pants are made from a variety of natural and synthetic materials. Woven nylon, leather-like plastic and woven denim fabrics (usually cotton-based) are challenging leather's cost and durability in an increasingly competitive market. Many manufacturers are now combining several materials in the production of each pair of pants in an effort to get the greatest benefits from the strengths of each material.

When shopping for pants, it's worthwhile to keep in mind that you generally get what you pay for. True, there are good deals around, but very often when you buy a cheap product, you get just that—a cheap product that you'll be replacing much sooner than you planned. Examine the competitive products to determine just what you're getting for your money, realizing that everything you're paying for may not be on the outside of the pants. For example, the quality and design of the stitching may appear fine in the store, but you certainly don't want the seams tearing after just a few weekends of use. You may see a salesperson take a particular pair of pants, grip them on each side of a seam and try to pull them apart. It's more than a corny sales approach—if the pants won't take that little bit of abuse in the store, what will they be like on your bike—or more important, when you go off your bike? If the salesman won't let you do a little pulling on the seams of a pair of pants, be wary of the product.

Check the padding in the hip, knee and shin areas. Soft padding may feel nice in the store, but it won't be the answer when you hit the ground—and you *will* hit the ground sooner or later. That's the time that you'll appreciate dense, substantial padding capable of absorbing a reasonable amount of the impact. Preformed plastic knee and/or shin guards are the latest touches for off-road pants, the guards being housed in zipper or velcro closed pouches in the front of the pant's legs.

Other things to check that affect the comfort, life and cost of the pants include the lining (the pants may or may not be fully lined to the bottom of the legs), and the zipper openings (unstitched openings around zippers in leather and vinyl may lead to premature tearing). The pants should fit well, but still allow you a full range of movement, remembering that the pants usually loosen up slightly after they're first worn (leather and vinyl stretch slightly at stress points such as knees, while woven fabrics generally develop some slack in the weave).

As always, this is not an attempt to show you everything available from every manufacturer of off-road riding pants. We're simply trying to expose you to manufacturers whose products you may not be aware of, or whose products may not be readily available in your area. If you like what you see here from any manufacturer, contact your local dealer or write directly to the manufacturer for more information. Ride safely. •

445 South Victory Boulevard
Burbank, California 91502
MODEL: Pro GP
COLORS: 16 available
MATERIAL: Leather
SIZES: Made to order
FEATURES: Nylon tricot lining; one AMA adjustable belt; plastic knee cups available.

BILL WALTERS LEATHERS, INC.

241 West 36th Street
National City, Calif 92050
MODEL: Mikkola (Koho)
COLORS: Red, white and blue (all)
MATERIAL: Nylon w/leather
SIZES: S, M, L, XL,
FEATURES: Leather on knee and seat; completely machine washable.

J.T. RACING

5345 Timken Street
La Mesa, Calif 92041
MODEL: Grand Prix
COLORS: Black w/stripes
MATERIAL: Leather
SIZES: 28/30/32/34/36/38/40/42
FEATURES: Fully lined; plastic guards over knees and shins.

TORSTEN HALLMAN RACING INC.

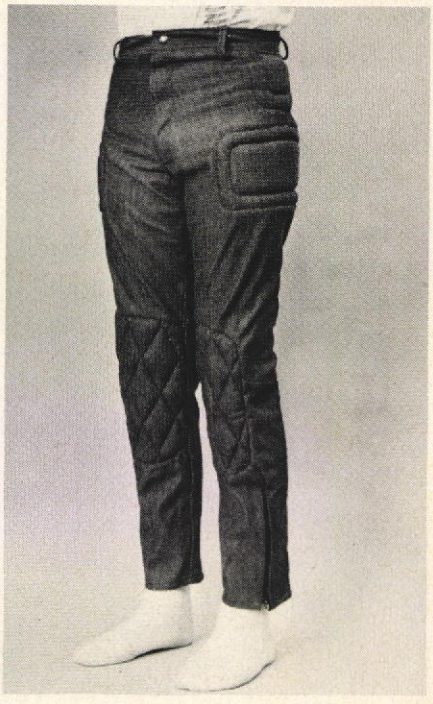
HARLEY-DAVIDSON MOTOR CO., INC.

3700 W. Juneau Avenue
Milwaukee, Wisconsin 53201
MODEL: 98145-73V
COLORS: Black w/orange stripes
MATERIAL: Leather
SIZES: 31/34/36/38/40/42
FEATURES: Leather belt; two pockets.

KAWASAKI MOTORS CORPORATION

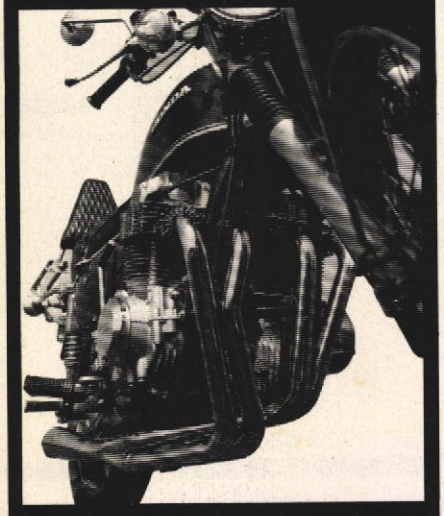
P.O. Box 11447
Santa Ana, California 92711
MODEL: Team Leathers
COLORS: Green w/white stripes
MATERIAL: Leather
SIZES: 28/30/32/34/36/38/40
FEATURES: Fully nylon lined; built-in belt; removable plastic knee cups.

AMERICAN SPORT RACER



P.O. Box 536
Reedsville, Pa. 17084
MODEL: Motorcycle Jean
COLORS: Blue
MATERIAL: Denim
SIZES: 24/26/28/30/32/34/36/38/40
FEATURES: Foam rubber padding; triple seams zippered leg closures.

HOOKER



They can copy the looks.
But they can't copy the performance.
There is one sure way to know you're buying the best.
Get Hooker.
Proven the best high performance exhaust systems in the world.

HOOKER ™ HEADERS

Send Hooker $1.25 and they'll send you information on all their products. Including auxiliary gas tanks, air filters and the super fiberglass spoilers & fender flares for vans. Write Hooker at 1032 West Brooks Street, Ontario, California 91762.

2745 E. Huntington Drive
Duarte, California 91010
MODEL: Men's Moto-X
COLORS: Black w/red stripes
MATERIAL: Leather
SIZES: 28/30/32/34/36/38/40/42
FEATURES: Fully lined; built-in cinch belt; floating plastic knee cups.

MODEL: Boy's Moto-X
COLORS: Brown
MATERIAL: Leather
SIZES: 14/16/18/20
FEATURES: Fully lined; built-in cinch belt.

TOP GEAR ACCESSORIES

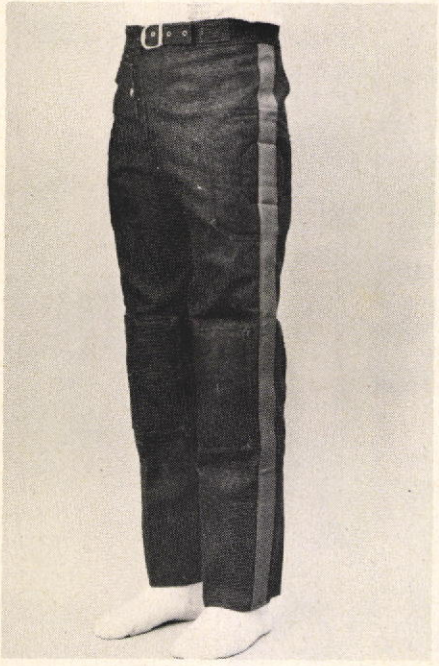
ROYAL/GRANT

16960 E. Gale Avenue
City of Industry, California 91749
MODEL: n/a
COLORS: Blue w/red & white stripes;
Gold w/black & white stripes.
MATERIAL: Nylon
SIZES: S, M (men's)
M, L (boy's)
FEATURES: Wide belt loops; padded hips.

LANCER LEATHERS

10624 N. 19th Avenue
Phoenix, Arizona 85029
MODEL: 315/Jim Pomeroy All American
COLORS: Red, white and blue
MATERIAL: Leather
SIZES: 28/30/32/34/36/38 (men's)
22/24/26 (boy's)
FEATURES: Vent-Air ventilation avialable; lined or unlined.

1031 W. Brooks Street
Ontario, California 91762
MODEL: Moto-X Denims
COLORS: Blue w/red or yellow stripes
MATERIAL: Denim
SIZES: 22/24/26/28/30/32/34/36/38
FEATURES: Hip and knee pads; snap closing pocket.



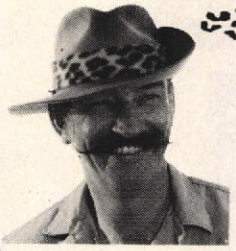
CASLER PERFORMANCE PRODUCTS

BATES INDUSTRIES, INC.

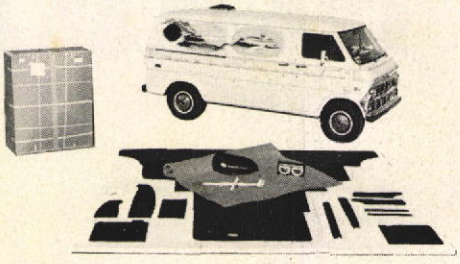
701 West Cowles Street
Long Beach, Calif. 90801
MODEL: Custom Motocross
COLORS: 24 available
MATERIAL: Leather
SIZES: 30/32/34/36/38/40
FEATURES: Stretch lining; built-in belt; three zippered pockets; shin guards; plastic knee cups.

P.O. Box 1086
Riverside, California 92502
MODEL: All American
COLORS: Red, white and blue;
Blue w/gold stripes
MATERIAL: Nylon w/leather
SIZES: S, M, L, XL
FEATURES: Built-in belt; removable plastic knee and shin protectors.

MALCOLM SMITH RACING PRODUCTS



"If you're hunting for real values in van interiors and accessories, Safari's got them! Check out these low, low prices."

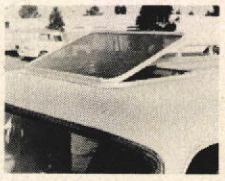


ENGINE COVER Made of heavy duty quilted Naugahyde — insulates against engine heat, quiets interior. Has map pockets. Can be installed by anyone. **$29.95.**

DRINK TRAYS A must for vans and motor homes. Holds glass or can within easy reach. Storage space beneath. Only **$19.95.**

TAYLOR VAN KITS . . . Your choice of wood grain paneling or genuine Naugahyde. Complete kits include everything from insulation to stereo speakers. Strip kits include all the panels, head lining and installation hardware. Complete instructions make it easy to install with simple hand tools. Choose from 8 colors of stitched Naugahyde in full diamond pleats. Wood panel strip kits start as low as **$199.** Naugahyde strip kits start at **$350.00.**

SUN ROOF Let the sunshine in. Bolt-on a Taylor sun roof. Has solar control mirror finish that reflects sun rays. Cut out size is 31" x 18", opens 30°, has positive locking device. Cinch to install. **$125.00.**



TRUCK & MINI-TRUCK TARPS Taylor tarps are made of custom stitched Naugahyde — complete with snaps. Gives your truck a sharp, custom look. Cut-outs for roll bars available. Specify year and model. As low as **$49.00** for Mini-Trucks, **$69.00** for Maxi-Trucks.

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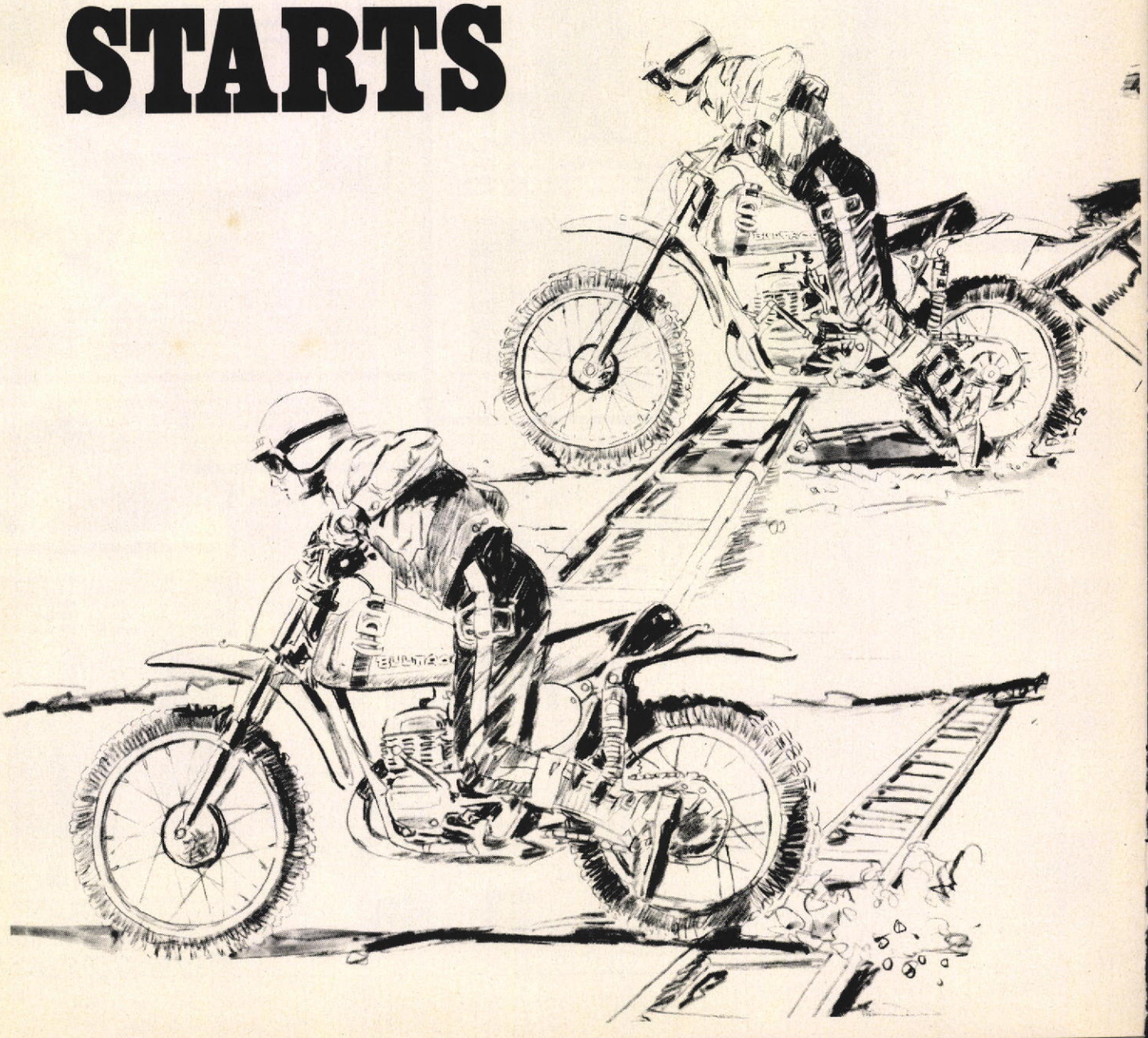
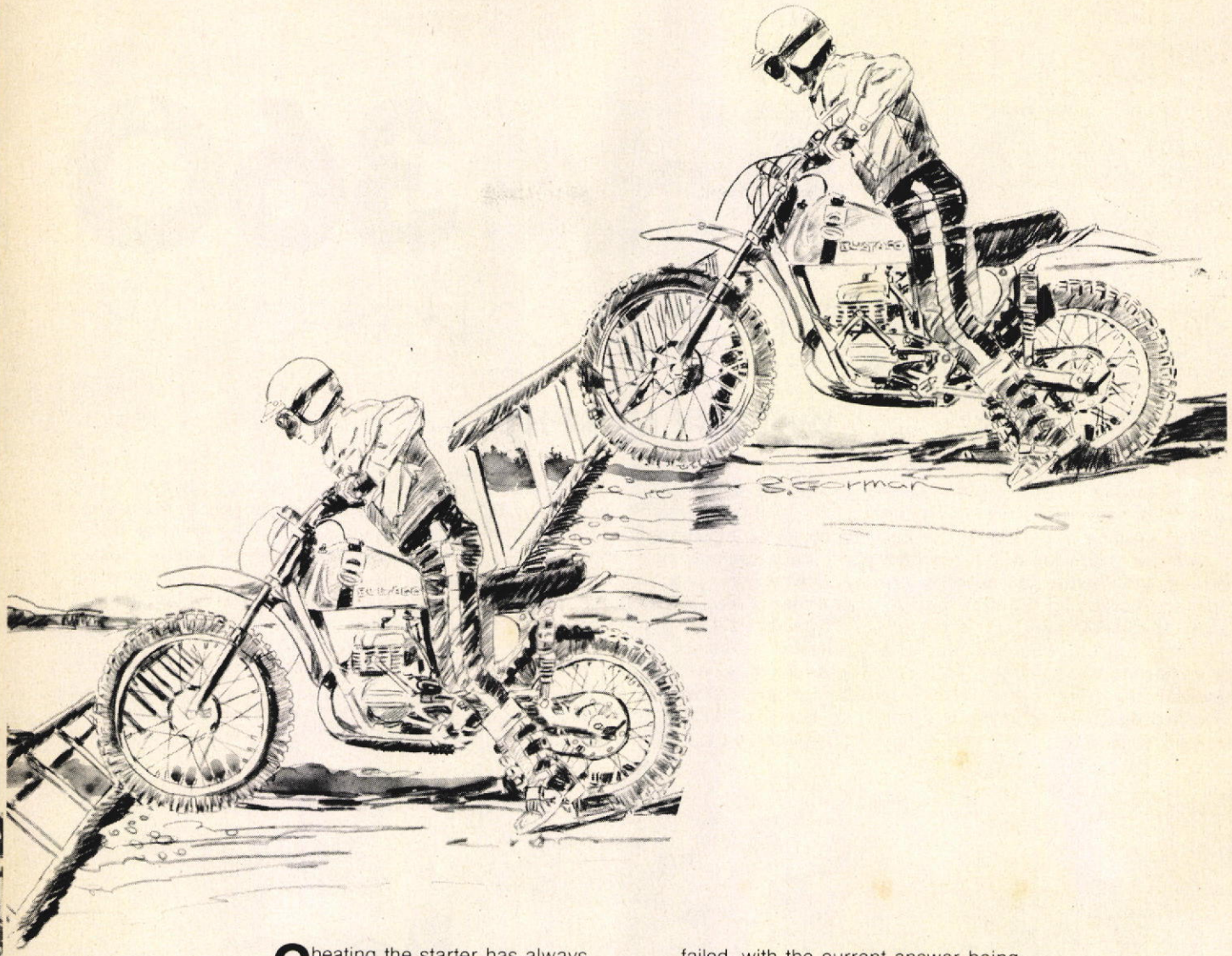
HOW TO RIDE

Text by Dave Ekins, Senior Editor

HOT MOTOCROSS STARTS





Cheating the starter has always been a part of racing. After all, if you are the first into the turn then the competition has to get around you, which is better than you trying to get around them. Besides,those first few laps are clear sailing, no dust or spray from the other guy's rear tire.

They used to line up on a chalk line and wait for the starter to wave his flag. Some guys got so good at reading the starter they had their clutch out before he began his motion. This fraction of a second usually got the cheater into the first turn first. Competition at the starting line became more fierce, cheating the cheaters and forcing the starter to the point where they tried dead engine starts, hand on the helmet starts, and even stretched a rubber band across the start line. All failed, with the current answer being the starting barrier.

We won't get into which part is best, middle or end, because that depends on the race track. This is a simple lesson in how. Start with the front wheel about 6 to 10 inches behind the barrier. When the starter releases the holding pin most bikes are pushing the barrier down. If you are back a ways you are running forward with the gate dropping ahead of you, the other guys are at a standstill.

By the time you're even with them you've got a run on 'em. Keep your weight forward and the rear wheel spinning. Leave both feet on the ground to hold the bike straight and allow them to drag behind while in first gear. Practice as often as possible. •

YAMAHA 360

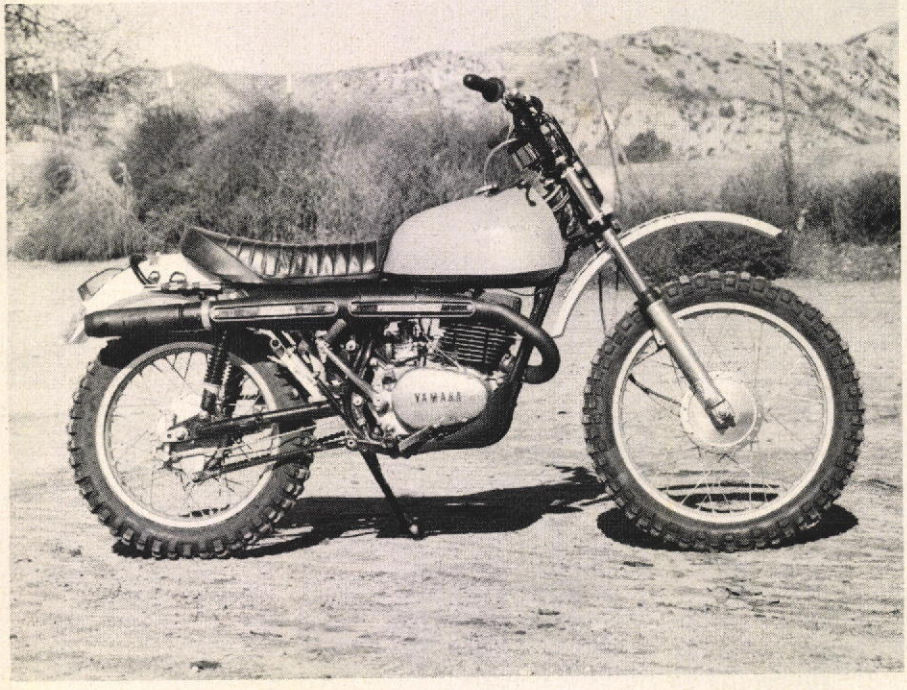
Project Bike: Part 2, Bolt-on Horsepower

by TONY MURPHY

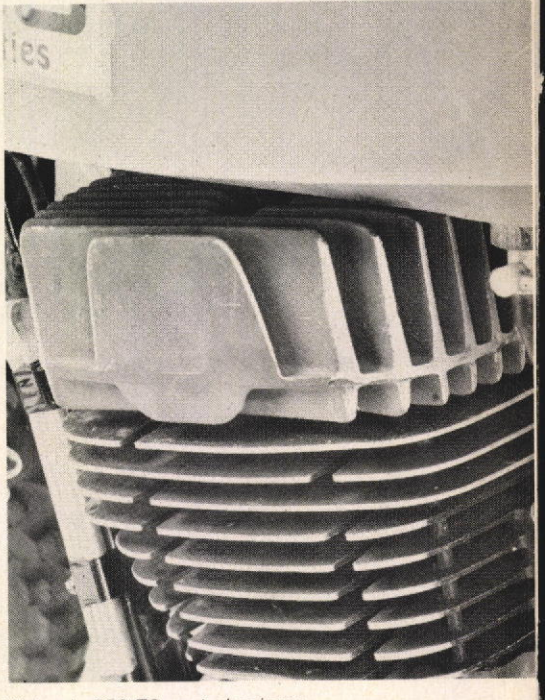
Last month's segment of our Project Yamaha dealt with improving the handling qualities of the stock chassis. It's always a good idea to get the handling upgraded before any attempts are made at increasing engine performance. This month we'll tackle the engine and complete what we feel is a fine enduro machine capable of finishing well in any event.

Satisfied that the engine's lower end was up to handling a few more horsepower, we opted to limit modifications to the bolt-on variety. They're easy to accomplish and therefore should interest those with a minimum of facilities. And when you can bolt-on power out of a mail order catalog,all the better.

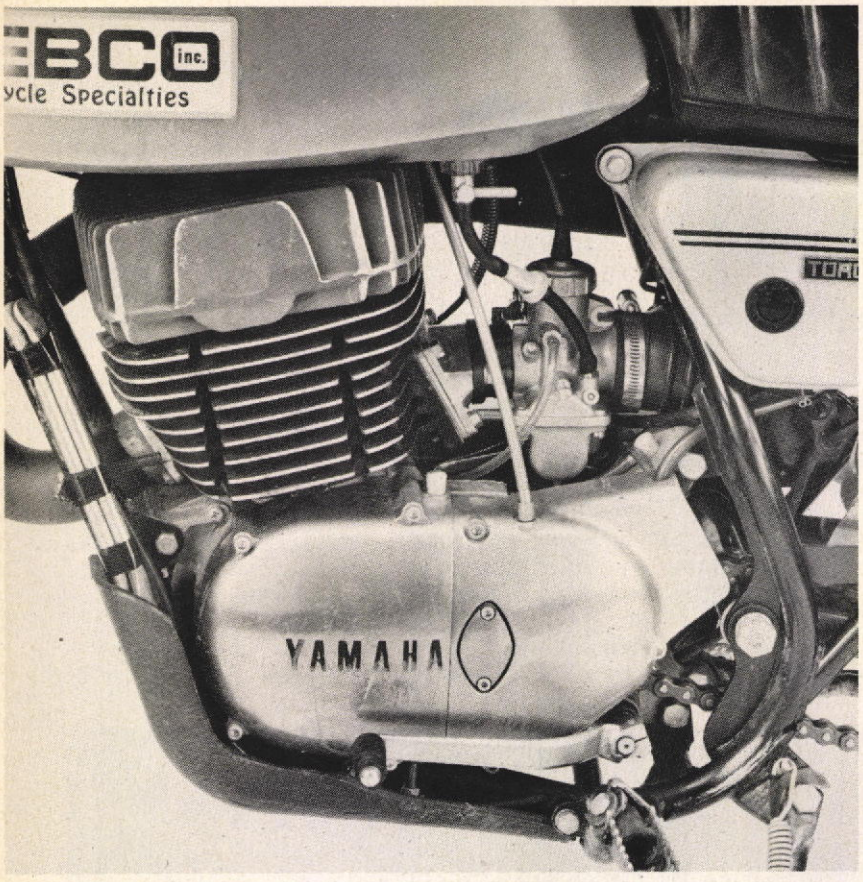
Convinced that a little more compression, a larger carburetor and a less-restrictive exhaust system should be our phase one, we installed a Webco head, a Torque Engineering pipe complete with a Forestry-approved spark arrestor and a larger, 32mm, Mikuni carb. The performance increase was instantaneous. The engine not only revved more freely, it actually possessed a much wider power range. It can now be lugged in the higher gears without fear of stalling and yet it can be ridden hard and fast at higher revs. What was to be only phase one of our engine hop-up project was so impressive we've decided to leave it just as it is. At least for the time being. •



Enduro ready RT360 is fine example of over-the-counter bolt-on pieces. Last month we installed the Petty fenders, skid plate, and headlight/number plate. Goodyear Eagle tires, handlebars, and relocation of the speedometer for easier viewing made up most of the project. This was all done without any major cutting.

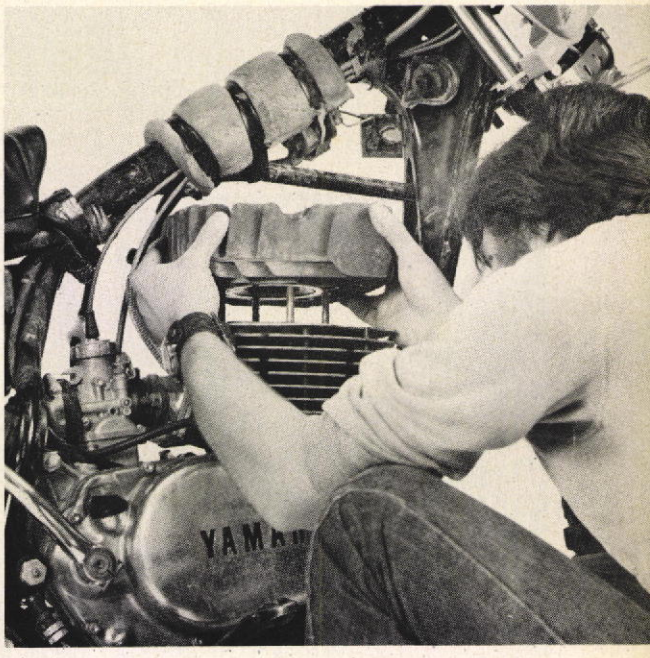


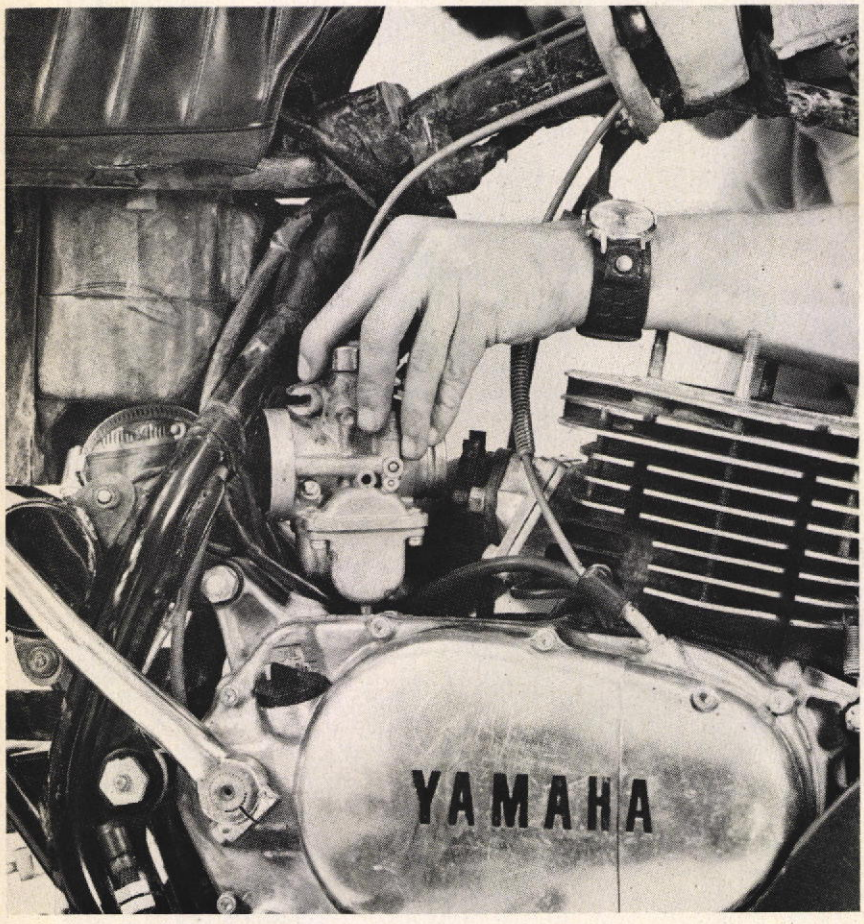
Webco's 356-T6 cast aluminum cylinder head is engineered for more hp and better cooling. $41.95 is a little steep but the hp is guaranteed.



Left: Stage 1 engine looks stock except for square finned cylinder head. 32mm Mikuni is from the same body as the smaller stock one; you can't tell just by lookin' at them.

Below: You've got to remove exhaust system and fuel tank to get the head on and off. Assembly is straight forward using factory recommended torque pattern and specs.





Above: After swapping throttle cable from one carburetor to the next, just slip the spigot end into its adapter. Rubber hose to the air filter should be secured with good aircraft quality hose clamp.

Above: Torque Engineering exhaust systems are available for most bikes in many configurations. This one is a Whispern' Smith "up pipe" with Forest Service approved spark arrester and muffler.

BIKE BASICS:
IGNITIONS

by MIKE GRIFFIN

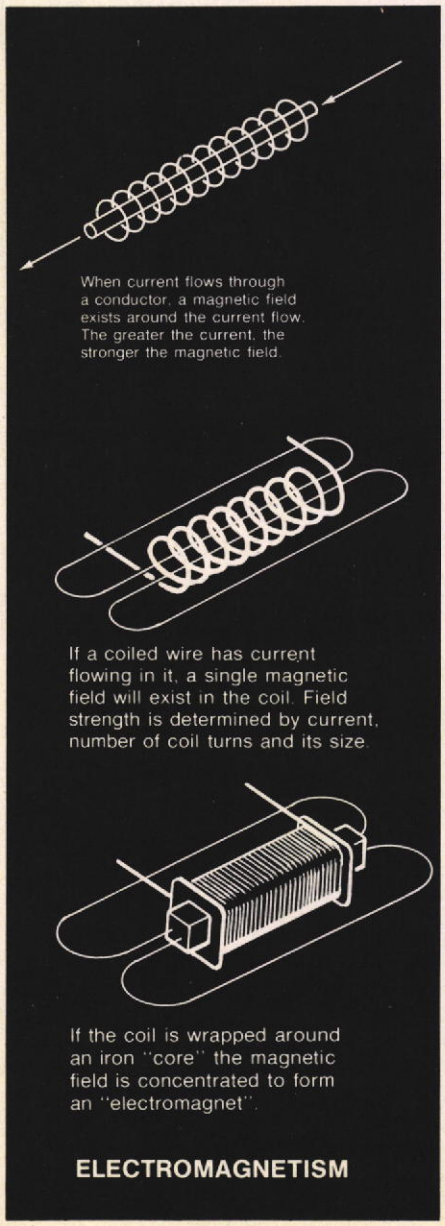
While they may seem mysterious, ignition systems are really simple devices

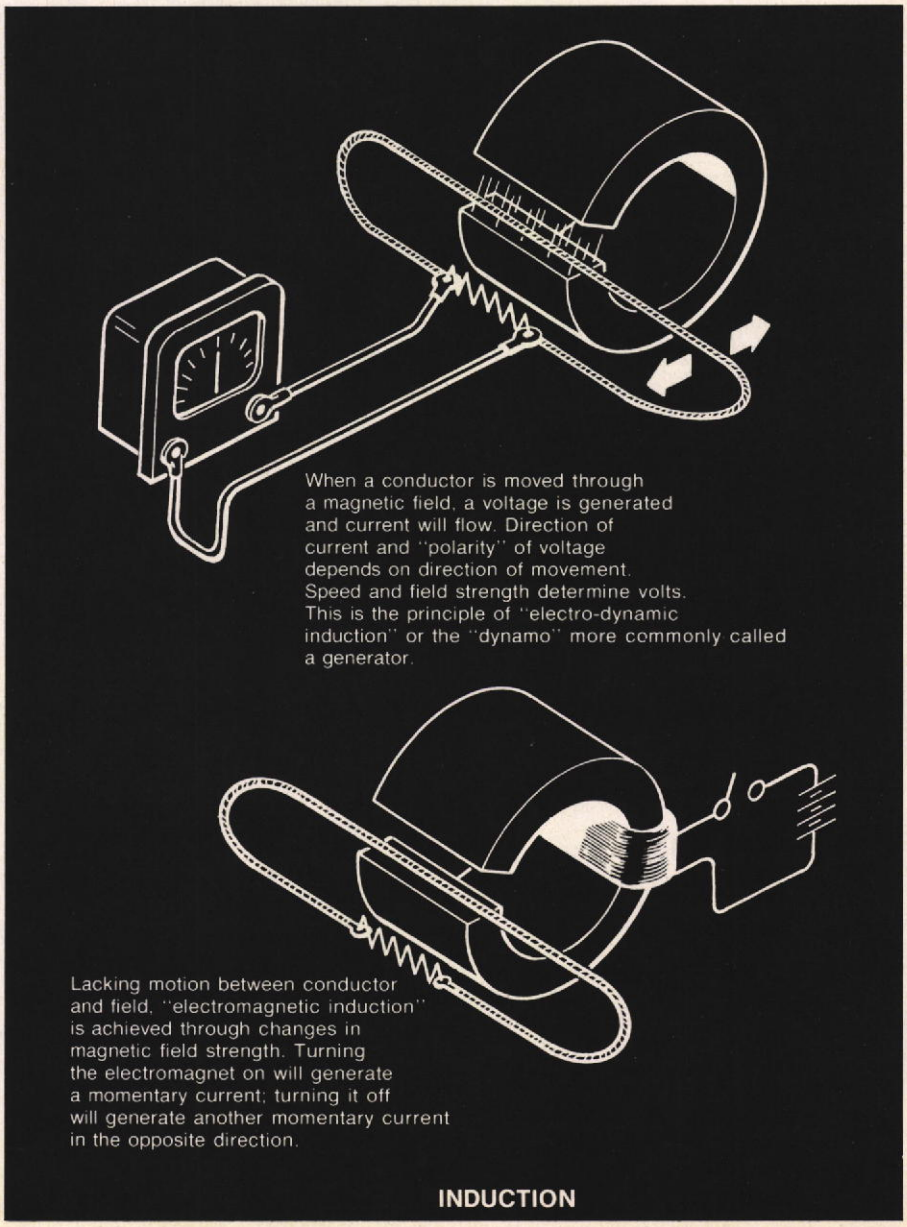
Not so long ago its dazzling displays struck fear and reverence in the hearts of men. Now, however, we have a name for it: electricity. Where does electricity come from? Well, it's hard to say. You might as well ask where do we come from or how wet is water. Electricity is around us, in us and everywhere.

Very simply, electricity as we know it is the flow of sub-atomic particles called electrons from one point to another. Nobody has ever seen electricity itself—not even Gordon Jennings. What about lightning? What about the stuff that sparkles on the end of my NGK spark plugs and shocks me when I'm careless?

Well, my friend, that is not electricity. It is merely its effect. What we see as lightning and visible spark is actually superheated air molecules brought to brief incandescence by the almost instantaneous flow of electrons through the air. And what you feel when you accidentally ground yourself while holding a spark plug lead is also the *effect* of electrons flowing through fingers and nether regions back to its ground connection. Most of the hurt you feel is actually due to the sudden contraction of your muscles brought about by the charge; an ethereal charley horse.

But just because we can't see it doesn't mean we can't use it. Indeed,


When current flows through a conductor, a magnetic field exists around the current flow. The greater the current, the stronger the magnetic field.
If a coiled wire has current flowing in it, a single magnetic field will exist in the coil. Field strength is determined by current, number of coil turns and its size.
If the coil is wrapped around an iron "core" the magnetic field is concentrated to form an "electromagnet".
ELECTROMAGNETISM


When a conductor is moved through a magnetic field, a voltage is generated and current will flow. Direction of current and "polarity" of voltage depends on direction of movement. Speed and field strength determine volts. This is the principle of "electro-dynamic induction" or the "dynamo" more commonly called a generator.
Lacking motion between conductor and field, "electromagnetic induction" is achieved through changes in magnetic field strength. Turning the electromagnet on will generate a momentary current; turning it off will generate another momentary current in the opposite direction.
INDUCTION

the things we have done to and with electricity in past decades would awe T. Edison himself, so far have we come in harnessing this elusive commodity.

Nevertheless, despite all that man has learned of the stuff, it still remains a mystery to most of us. If, however, we confine this article's explanations to those of motorcycle ignitions, the oft-troubled mind of the reading biker may find it not so complicated after all.

A couple of centuries ago it was discovered that when a wire was moved through a magnetic field electrical current was generated. Why this happens, nobody knows, but somehow the movement of an object made of some appropriate metal through a magnetic field would give rise to electricity. Subsequently, throughout the years we have learned to take advantage of and maximize this effect. Now what we do is pass finely wound coils of wire through magnetic fields at relatively high speeds. This results in a good, viable electrical energy source.

Experimentation throughout the years has also brought us the electromagnet. What this is is a manually controllable magnet. The permanent magnet is just that: permanent. It cannot be shut off but scientists of yore discovered that by winding wire around and along a metal core and then connecting each wire end to a battery terminal, why, by golly, you could turn the magnet on and off just like the lightbulb, which hadn't been invented yet.

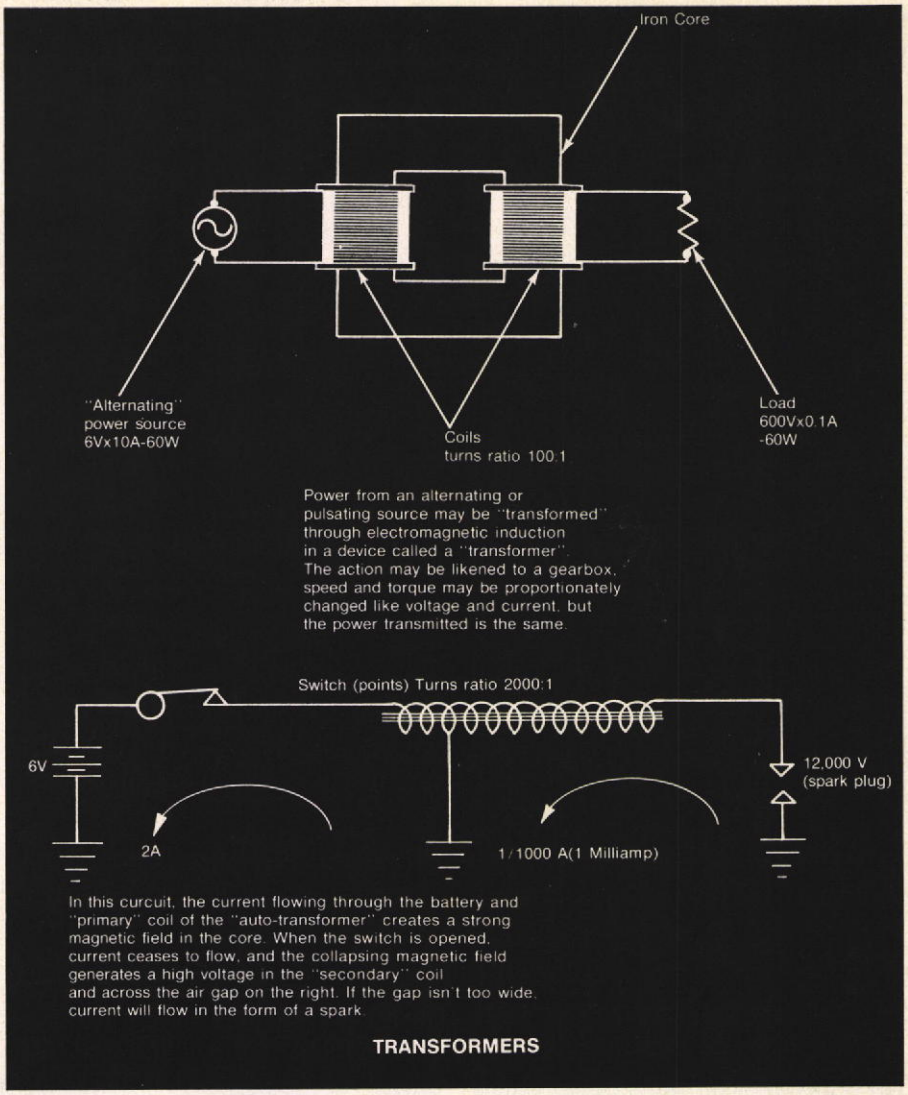
So, what we have in our contemporary motorcycle generator is a device that has electromagnets fixed in a housing. This fixed assembly is known as the stator. When current from the battery is applied to these coils they become electromagnets, thus emanating a magnetic field, otherwise called flux. Oh, and the electromagnets are called field coils.

In the center of the electromagnetically induced field rotates an armature. This is actually just another assembly of wire windings, although they are arranged somewhat differently than the field coils and are connected to commutator bars.

When the armature is spun in the stator, electric current is generated. This current is picked up and carried away from the armature via carbon contacts that bear against the spinning commutator surface. Simple, huh?

Okay, so now that we have this electricity, what are we going to do with it?

Well, the most important thing to do is get this current to the spark plugs to keep the engine running. This brings us to the ignition coil, which gives rise to another of nature's electrical phenomena, induction. Here, a current generated in one circuit is used to induce a current in an entirely different circuit. To understand this, you must first understand the how and why of the high tension coil.


Iron Core
"Alternating" power source 6Vx10A-60W
Coils turns ratio 100:1
Load 600Vx0.1A -60W
Power from an alternating or pulsating source may be "transformed" through electromagnetic induction in a device called a "transformer". The action may be likened to a gearbox. speed and torque may be proportionately changed like voltage and current. but the power transmitted is the same.
Switch (points) Turns ratio 2000:1
6V
2A
1/1000 A(1 Milliamp)
12,000 V (spark plug)
In this curcuit, the current flowing through the battery and "primary" coil of the "auto-transformer" creates a strong magnetic field in the core. When the switch is opened. current ceases to flow, and the collapsing magnetic field generates a high voltage in the "secondary" coil and across the air gap on the right. If the gap isn't too wide. current will flow in the form of a spark.
TRANSFORMERS

This unit is composed of two separate coil windings. And although in the typical ignition coil these windings are wound over each other, by virtue of various insulations, there is no direct connection between the two. The point of all this is when you feed current to one coil it will be picked up by the other coil. There is the primary coil and the secondary. The primary contains a relatively small number of turns of heavier gauge wire. This creates a strong magnetic flux. The secondary contains a large number of turns of finer wire, which allows for easier saturation by the primary flux: To boot, the primary and secondary coils are wound over a common iron core. The purpose of this core is to act as an efficient pathway for the primary flux on its way to the secondary windings.

Now, before we go further, let us back up a few steps to recapitulate what we have discussed thus far. We know now how electricity is generated and we also know the basics of the ignition coil, and that there is no physical connection between the primary and secondary windings.

We could not take current directly to the spark plugs from the generator and expect the things to fire. The combustion chamber can be considered a rather hostile environment, in some respects, due to its high temperatures and pressures. Trying to make a comparitively low voltage spark jump a gap here is nigh impossible. It is for this reason we resort to the high tension coil. What this item does is take maybe six volts and multiply it to perhaps 15,000 volts. By using a mechanical trigger we can do this thousands of times per minute. The mechanical trigger is the breaker points.

So, imagine this sequence: current is produced in the generator, taken to the coils via the breaker points, the coils magnify the voltage greatly and finally a spark jumps an explosive gap.

As we discussed earlier, electrical current occurs when magnetic flux passes over a wire coil. Now an ignition coil has no moving parts, so the primary flux doesn't pass through the secondary windings as the result of any mechanical means. However, the magnetic flux of the primary windings is manipulated by the opening and closing of the ignition points. When the

IGNITIONS

points are closed magnetic pulse is building up in the primary coil. As engine progresses through its operating cycle the points will be bumped open by the point cam. When this happens the magnetic energy stored in the primary windings suddenly collapses, and in doing so passes into the windings of the secondary coil, thereby inducing a great dollop of current. The voltage (electrical pressure) of this current is multiplied many times over due to the greater number of wire windings in the secondary coil. A heavily insulated lead wire carries this magnified current from the secondary coil directly to the plug.

Aside from the spark plug, which is often prone to burning, fouling or similar maladies, the weakest link in this energy producing chain is the contact breaker assembly. As we said earlier, in normal operation they are opened and closed thousands of times per minute. Though mechanically very simple, their job is a most difficult one. Thus, despite the fact that the point surfaces are made of a tungsten compound—tungsten is comparitively inexpensive yet has an admirably high melting point, is quite hard and resists corrosion well—the things still fail. Most often they stop working because of wear and tear and pitting.

Little can be done about wear and tear; to keep everything in good fettle and adjusted to specs is about all you can do. However, if ignition points display a marked tendency to burning and pitting, well this is a different matter. Enter the condenser.

As we said before, a cam turning with the engine opens the points each time a spark is needed for combustion. Point burning and resultant pitting is caused by arcing, i.e. an electric arc spans the growing gap between the points as they are being bumped open. Surely years ago when ignition systems were first being sorted out, engineering types were tearing their pomaded hair out by the fistful, trying to solve the arcing problem. And it was a real hassle. The lifespan of a good set of points was shorter than a Toulouse Lautrec windsprint.

Soon enough, however, some well intentioned problem-solver said: "Hey, why don't you designers put a condenser in the point circuit?"

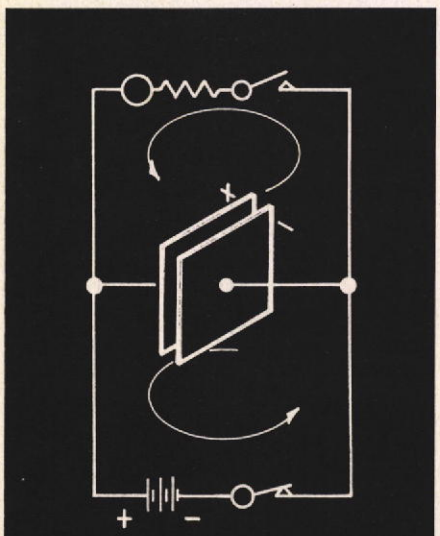
And with faces drawn in wonderment and awe, the designers looked at each other and said: "What the hell is a condenser...?"

The rest of the episode is illegibly smudged on the pages of internal combustive history. The condenser, however, has survived, to our benefit and good fortune.

In the early days of electrical research it was discovered that an electrical charge can be temporarily stored between two metal plates. The amount of charge is dependent upon the area of the plates and how far apart they are. Okay, so let's incorporate one of these things in the breaker point circuit: Closing the switch (points), besides charging the primary coil, charges the plates. When the points open, however, the charge remains. When the points close again, current will flow momentarily until the plates are discharged. If you find this confusing, you're not at all alone. So, for the sake of clarification, let's use an analogy. Compare the electrical system to a late model auto's closed cooling system. The former supplies current, the latter provides coolant. Where the cooling system has a catch-tank for expansion and surge overflow, the electrical system has the condenser. To compensate for uneveness in water density and flow, the cooling system's catch-tank accumulates coolant (current) that would otherwise be wasted (arced). Bear in mind, though, that while the cooling system's cycles take place over a period of hours or minutes, the electrical system's cycle occurs in microseconds (millionths of a second).

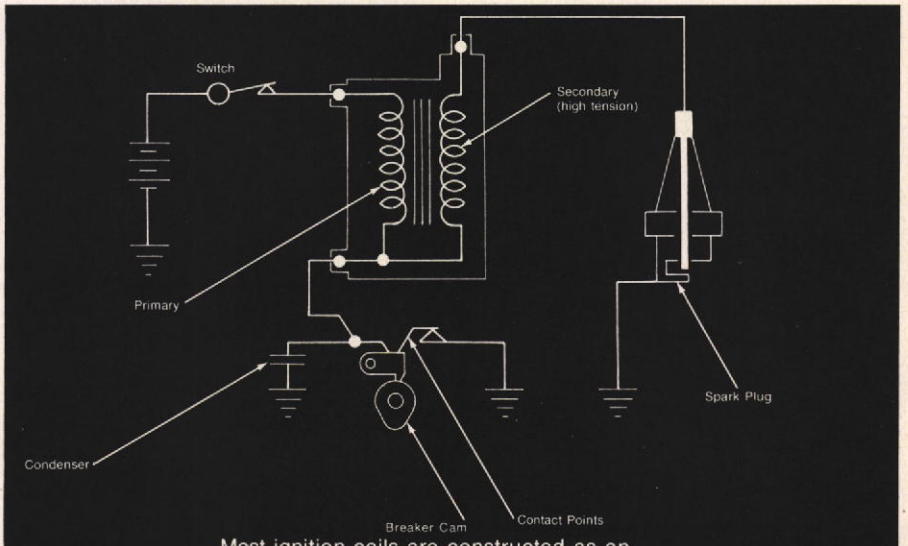
The end result of all this is an arrangement where the condenser acts to protect the points from arcing as they open by actually short-circuiting as it charges. By the time the condenser is fully charged, the points are open far enough, and current has stopped flowing to the primary coil.

The system described above is your



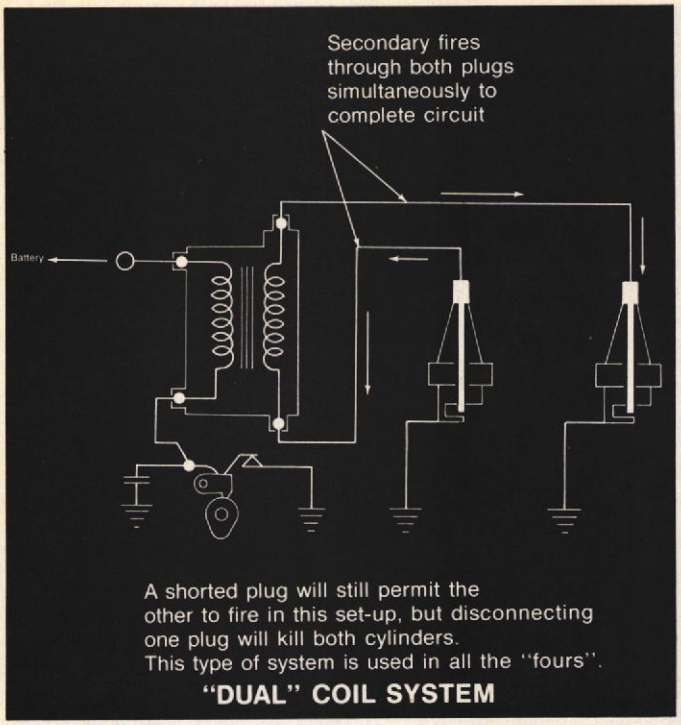
An electric "charge" can be temporarily stored between two metal plates. The amount of charge depends on plate area and separation. Closing switch charges the plates, and when it is opened the charge will remain. When switch is closed, current will flow momentarily until the plates are discharged. The ability to store a charge is called "capacitance", and such storage devices are called "capacitors" or "condensers".

CAPACITANCE



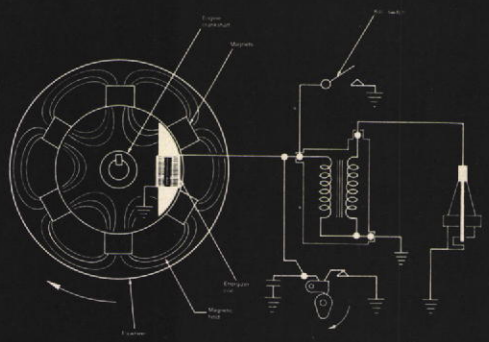
Most ignition coils are constructed as an auto-transformer. Pulsating current for its operation is provided by the "make and break" action of the contact points in the primary circuit. A cam, turning with the engine, opens the points to initiate a spark each time it is required for combustion. The condenser acts to protect the points from arcing as they open, by "short circuiting" while it charges. By the time the condenser is fully charged, the points are open far enough, and the current stops flowing in the primary. The collapsing magnetic field then generates a high voltage producing a spark across the plug in the combustion chamber.

BATTERY-POINT-COIL IGNITION



A shorted plug will still permit the other to fire in this set-up, but disconnecting one plug will kill both cylinders. This type of system is used in all the "fours".

"DUAL" COIL SYSTEM



"Direct" ignition systems do not have to rely on external battery power. Instead, magnets, turning in an engine-driven flywheel pass by the "pole pieces" of a coil's iron core producing a voltage to power the ignition coil. With the points closed, current from the energizer coil is shorted to ground. The points open at the time required for a spark, and high voltage is generated in the secondary by a rapid increase in primary current rather than a decrease. Position of the flywheel magnets in relation to the energizer coil is critical at firing time; the magneto must be generating maximum voltage as the points open.

MAGNETO-POINT-COIL IGNITION

typical battery-coil ignition system. For the sake of clarity we have taken some liberties in it explanation. We have, for instance, pretty much ignored the battery and regulator. In a battery-coil system current does not travel directly from generator to points and coil, thence to spark plug. Actually, in most cases the generator (or alternator) functions as a power source for the battery. Current for ignition is, in turn, drawn from the battery for ignition. If you find this befuddling, imagine the generator as a water spring feeding a reservoir (battery). The reservoir is drained by sundry creeks and streams (lights, horn, maybe starter motor), some large and some small.

The magneto is a somewhat simpler ignition system in that it does not have to rely on external battery power. Basically, it implements a magnet spinning past a fixed energizer coil to produce current. With the breaker points closed current coming from the energizer coil is shorted to ground. Maximum flux flow and voltage occur just as the permanent magnets and coil pole pieces reach alignment. In a magneto it is when this alignment takes place that the points open, which results in a surge of current about four amperes and 300 volts in strength to the primary windings of the spark coil. Now contrary to battery-coil ignition systems the secondary spark voltage is generated by the rapid *increase* in primary coil current. (Remember, in the battery-coil system, the secondary spark resulted from the *collapse* of primary coil current.)

Besides its duty of providing ignitive spark for the engine, the magneto, like the generator, is often fitted with other coils. These produce current for such ancillaries as battery lights and horn.

Probably the simplest form of ignition is the total loss arrangement. You'll sometimes see this on lightweight road racers where poundage is kept to an absolute minimum. The total loss does away completely with rotating magnets and coils, for the only source of power is the battery. This is connected more or less conventionally through the points to the secondary coil. In this way, no flywheel is really necessary to minimize both reciprocating and overall weight. The only problem is—you guessed it—when the battery runs down the bike runs down. Depending, of course, on the components used, the type of riding and the strength of the battery, the total loss can keep a small-bore motorcycle going for an hour or so before running out of juice.

On the whole, however, motorcycle racers prefer a battery-less magneto ignition for reasons of acceptable lightness plus the ability to deliver a very hot spark.

By and large, though, even the magneto's days are numbered. We are not rashly implying that obsolescence is around the corner, no. We are saying that in many respects the advantages of the CDI, or capacitive discharge ignition are indeed alluring.

You sharpies out there have probably already be musing to yourselves: "Why fool around with feeding the primary coil a measly 6 or twelve volts? Give it a real shot of juice for a dynamite spark." Well, if you tried this with existing components, you'd surely have problems, like fused breaker points and an epoxy puddle that used to be a coil.

However, the space age has brought us a cornucopia of electronic benefits, among them high voltage solid state components . . . just what we've been looking for.

To grasp how the CDI works, we suggest you throw out all the principles we've discussed up to this point, with the exception of the high-tension coil and the spark plug.

Let's start with a power source. The CDI will let us use battery or magneto power to provide our initial current. This current is piped into a high voltage convertor. In this way, what began as six or twelve volts has been boosted to 300-400 volts through use of transistorized circuits. From the high voltage convertor the charge goes to a special high voltage capacitor (or condenser, only the names are different). The output of this capacitor is controlled by a signal generator magnet that turns with the engine, working in league with a trigger coil and a solid state electronic switch. This capacitor will discharge into the primary coil only when the switch tells it to, and the switch only works when the trigger actuates it.

Let's run the ignition through its cycle and see what happens. In the previous paragraph we charged the capacitor, converting 6 or 12 volts from battery or magneto into maybe 400 volts. Now we must wait until the signal generating magnet, mounted, say, on the end of the crankshaft, sweeps past the trigger coil. (The trigger coil's position in relation to the generator is crucial, for it determines firing time.) Okay, so here comes the magnet coming past the trigger coil. In this instant a small current in generated in the coil. This current is passed into the solid state CDI's mysterious "black box". Among other things in this box is a solid state switch. This switch is the

one that controls the capacitor. In this way, the current coming from the trigger coil gives the nod to the switch. The switch, in turn, almost instantaneously grounds the capacitor. This results in all that voltage stored in the capacitor being suddenly dumped into the primary windings of the coil where it is magnified many, many times and then passed on to the spark plug.

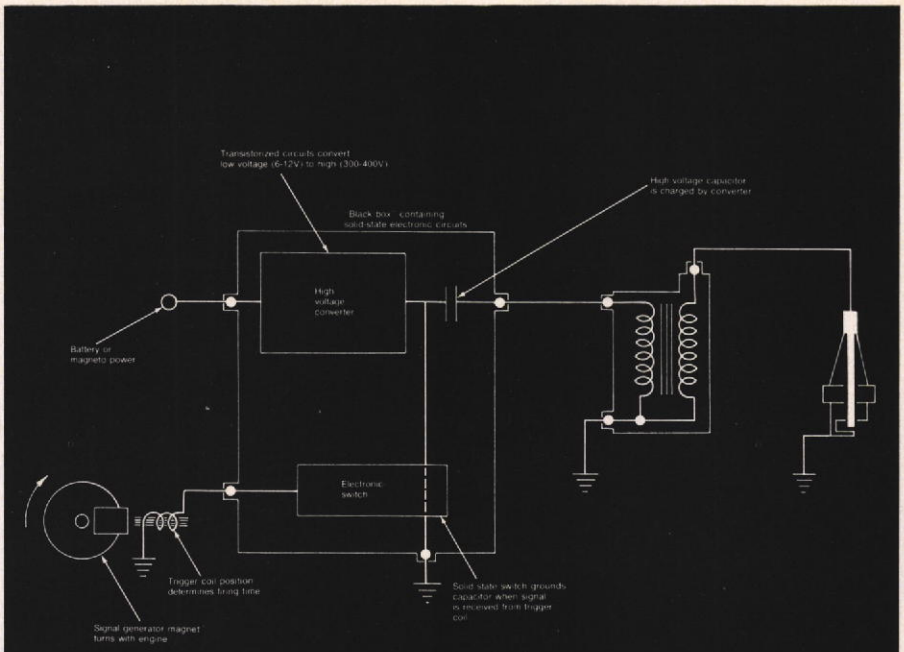
Why doesn't the coil melt, what with all that electrical power coursing through it? Good question, and this brings up another of the CDIs virtues: rise time. It takes a conventional battery-coil ignition system about 100 microseconds to develop spark-worthy voltage. (A microsecond is a millionth of a second). In comparison, a good magneto can do the same thing in about 35 microseconds. But next to these figures the CDI is unquestionably tall hog at the trough, for its rise time is less than 10 microseconds! The reason the coil does not melt is that the jolt of high primary voltage happens so fast that the coil doesn't have a chance to get inordinately hot.

In the world of motorcycling there are several different makes of CDIs: Lucas (England), Bosch and Krober (Germany), Femsa and Motoplat (Spain). They each have their detail differences but all are predicated upon the principles.

For the motorcyclist not inclined to hop up his machine through installation of a racing magneto or, more ambitiously, a CDI ignition, there is still an element of efficiency to be gained from eliminating those often troublesome breaker points. Boyer-Bransden of England produces a bolt-on magnetic trigger assembly for such bikes as Honda, Triumph and Norton. These conversions are quite easy to perform and involve little more than removing the mechanical breaker points and related items and installing the new components. Once timing is set, it is set permanently; no need to change it and there are no points to wear.

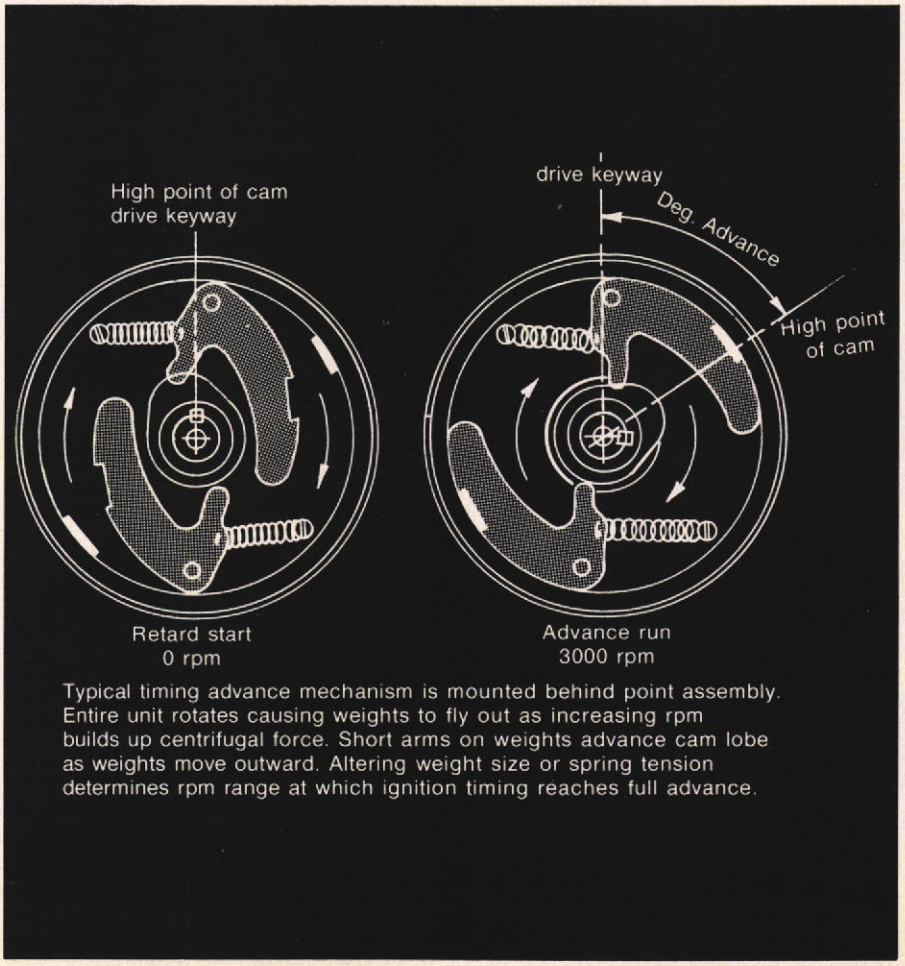
If we could see electricity, if we could feel it, if electricity was, say, stringy, blue and bumpy, the humble human would surely spend less of his valuable time trying to understand it. Indeed, with stringy, blue and bumpy electricity we'd be able to follow it all around our motorcycles with ease, we could zero-in on trouble spots in a trice, why, we could even uncork our favorite Zinfandel, sit back and get our kicks just watching it wriggle and writhe and zap back and forth. •

NEXT MONTH IN BIKE BASICS: ALL ABOUT CLUTCHES


Transistorized circuits convert low voltage (6-12V) to high (300-400V)
Black box containing solid-state electronic circuits
High voltage capacitor is charged by converter
High voltage converter
Battery or magneto power
Electronic switch
Trigger coil position determines firing time
Solid-state switch grounds capacitor when signal is received from trigger coil
Signal generator magnet turns with engine

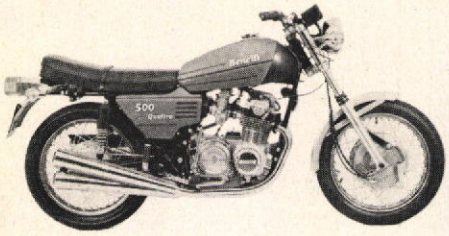
C.D.I. provides more consistent spark than breaker point systems. Rapid discharge of the capacitor produces secondary voltages about three times greater than normal.

CAPACITOR-DISCHARGE-IGNITION (C.D.I.)



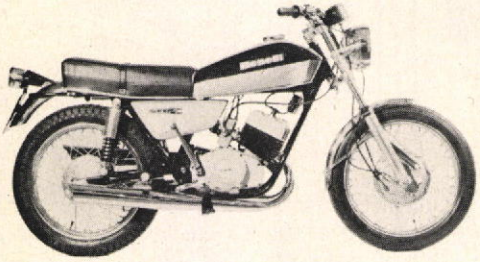
Typical timing advance mechanism is mounted behind point assembly. Entire unit rotates causing weights to fly out as increasing rpm builds up centrifugal force. Short arms on weights advance cam lobe as weights move outward. Altering weight size or spring tension determines rpm range at which ignition timing reaches full advance.

You can buy an ordinary motorcycle and invest in your dealer's fancy showroom and winter vacation...Or, you can buy Benelli and invest in performance, handling, and craftsmanship.



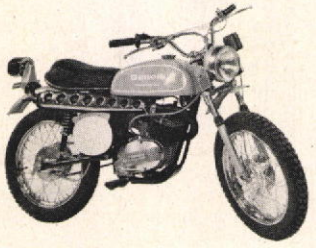
500 QUATTRO

The Benelli 500 Quattro sets new standards for performance, handling, and functional beauty. The Quattro combines smooth, responsive power with handling gleaned from years of Grand Prix road racing success. Standard features on the Quattro include Marzocchi suspension, Borrani rims, Veglia instruments, Tomasselli controls, and the latest Pirelli hi-speed tires. The Benelli 500 is built to a standard rather than a price, and has quickly established itself as the finest machine in its class.



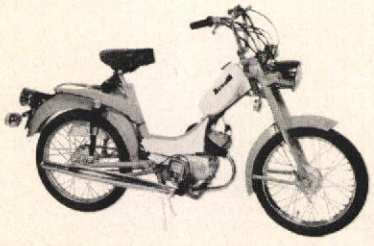
250 PHANTOM

This is the machine that won the production team trophy at the 1974 Isle of Man road races. The Phantom has a twin cylinder, 250cc, five-speed motor with electronic ignition and chrome bore, alloy cylinders. Thirty horsepower at 8,000 RPM power the Phantom to a top speed of 100 MPH. The Phantom has a lightweight alloy steel frame, Marzocchi suspension, and Pirelli tires to insure precise, predictable handling. A four-shoe front brake provides exceptional stopping power. One of the finest middleweight machines available at any price.



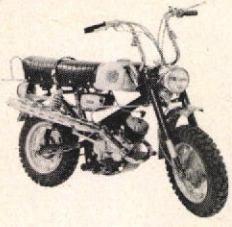
BANSHEE 90

The Banshee is an extremely powerful and fine handling mid-sized machine. The Banshee is powered by a 90cc, two-stroke, 5-speed motor with a radial cylinder head. A lightweight and rugged steel chassis is mated to proven Italian suspension to provide precise handling and optimum stability. Standard equipment includes Pirelli motorcross tires, skid plate, upswept exhaust, and braced motorcross handlebars. The Banshee has the best power-to-weight ratio in its class.



MOPED

Benelli Mopeds were originally developed for the European market, where economy and durability are essential features. The Benelli Moped is powered by a 50cc, two-stroke motor with pedal starting and an automatic transmission. A 3-speed, kickstart engine is optional. Standard equipment includes big 16 inch wheels with Pirelli tires, full suspension, luggage rack, and adjustable seat and handlebars. Easy to ride, easy to maintain, and easy to own!



DYNAMO TRAIL

A precision built miniature motorcycle. Powerful enough for road use, yet light and tough enough to tackle any terrain. A dependable 65cc, 4-speed motor delivers excellent performance with a minimum of maintenance. Standard features include full lighting, electric horn, speedometer, tool kit, Pirelli tires, folding handlebars, retractible luggage rack, and skid plate. Also available without lights for off-road use.

See your nearest Benelli dealer and check out the rest of the 1975 line. Benelli makes a full line of street and trail machines, from the economical 50cc Moped to the fabulous, soon to be released 750cc Sei. Dealers contact us for information on a low cost Benelli franchise.

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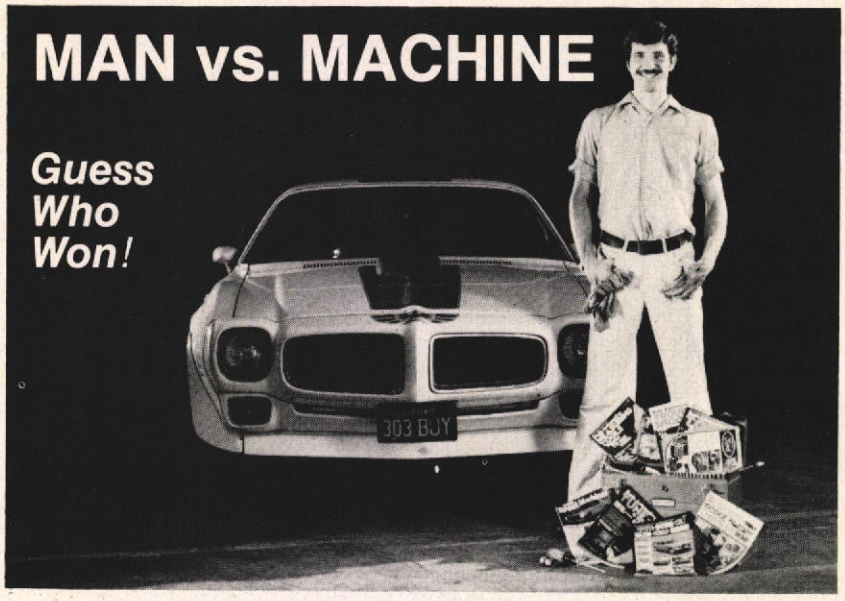

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HONDA 400 SUPER SPORT

continued from page 21

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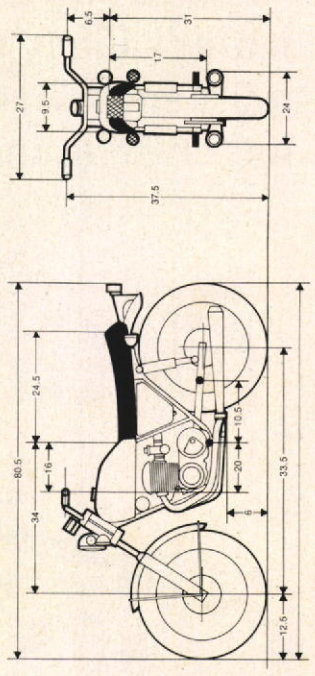

TEST BIKE: HONDA 400SS
Engine serial.....1000047

ENGINE

Type.....4 cylinder. 4-stroke S.O.H.C.
Displacement.....408cc
Bore x stroke.....51x50mm.
Compression ratio.....9.4:1
Lubrication system.....Full pressure-wet sump
Carburetion.....4-20mm Keihin
Air filter.....Treated paper
Ignition system.....Battery dual points/coil
Electrical system.....Alternator and 12v battery
Starting.....Electric and primary kick
Exhaust.....Four-Into-One

DRIVE TRAIN

Primary/ratio.....3.423:1 Morse Hy-Vo "Silent Chain"
Clutch.....Multi-plate. wet
Overall Gear ratios.....1st 20.91:1. 2nd 13.77. 3rd 10.52. 4th 8.50. 5th 7.38., 6th 6.62
Final drive/ratio (sprocket teeth).....17/38 (2.235)

CHASSIS AND SUSPENSION

Frame.....Tubular and steel pressings. single down tube. double cradle.
Suspension,
front.....Telescopic. 4.1 in. travel
rear.....Spring and shock. 3.5 in. travel
Brakes,
front.....Hydraulic disc 10-25 in. diameter
rear.....Drum SLS
Tires,
front.....3.00x18 Rib
rear.....3.50x18 Universal
Rim locks, front/rear.....No

WEIGHTS AND CAPACITIES

Weight, wet, unladen.....405 pounds
Fuel capacity.....3.7 gal.
Engine Oil.....3.7 qts.

STANDARD EQUIPMENT

Speedometer.....Front wheel driven tenth re-settable
Tools.....Under locking seat
Stands.....Side and center
Passenger provisions.....Yes

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ROKON 340 MOTO-CROSSER

continued from page 31

see-through type, allowing the rider to instantly check the fuel level. A well-padded seat blends in well with the rear of the tank and provides a comfortable riding position for those who like to slide around while cornering. A large air chamber beneath the seat houses the air cleaner element and is easily accessible. Preston Petty "Muder" fenders are used at both ends.

Riding the Rokon is an experience in itself. It is different, and as we've said, takes a little getting used to. It's capable of doing all the maneuvers one wants a moto-crosser to do, when you want it to do it, but the way that you get it to do it differs. If that sounds confusing, you've got some idea of how you'll feel when you take your first ride. Those spring-loaded weights in the small pulley have optional springs that determine the rpm at which the engine hooks up with the ground. On the MX it all happens at about 2500, but a weaker spring will a allow it to come in at under 2000; a heavier one at around three. It's an adjustment that can be made to suit individual riding styles.

So, as you sit there ready to go with the revs under 2500, you're absolutely stationary. Once the engine spins over 2500, the machine moves. The faster the revs build, the faster it moves. We even found ourselves doing an occasional wheelie when the throttle was nailed and traction was good. Snap the throttle shut and the revs drop, unhooking the drive belt and returning the engine to idle.

With all these happenings in mind, you can begin to put good laps together. We found that we had a tendency to close the throttle too much between spurts of power. This caused the drive to keep disengaging, resulting in sloppy cornering. Once we conditioned our right hand to leave the throttle just below the point at which it was driving the rear wheel, the transition from corner to straightaway became much smoother and more controllable. The only other conditioning required concerned the idle left hand and left foot. They had little to do. A most peculiar feeling. And, we confess, that left hand was caught grabbing thin air on several occasions.

The Rokon is definitely unique, but there's more to it than that. It is a serious MX effort that comes very close to the mark. We doubt that it will obsolete the current Open Class machinery, but it will make a good account of itself in any company. You'll be seeing a lot of them and the new breed that will learn to ride them. Ten years from now there may be some big-time MX stars who have never ridden with a "stick shift".●

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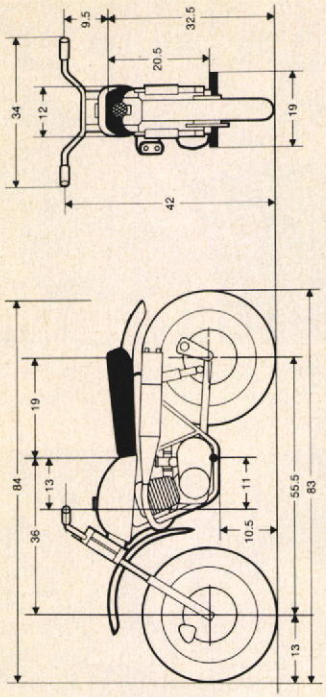

ROKON

MX340

TEST BIKE:
Base price as tested.....$1,645

ENGINE
Type.....2-Stroke single, piston port
Displacement.....335cc
Bore x stroke.....78mm x 70mm
Claimed HP @ RPM.....37 @ 6500
Claimed torque @ RPM.....28 ft. lbs. @ 6000
Compression ratio.....13:1
Lubrication system.....Pre-mix
Carburetion.....Mikuni VM36
Air filter.....Wet foam
Ignition system.....Bosch magneto
Starting.....Recoil, pull type
Exhaust.....Muffler w/spark arrestor

DRIVE TRAIN
Clutch.....Torque convertor
Gear ratios.....From 3.76:1 to 0.87:1
Final drive/ratio
(sprocket teeth).....4.15:1, 13/54

CHASSIS AND SUSPENSION
Frame.....Double loop
Suspension,
front.....Betor
rear.....Koni
Brakes,
front.....11-inch disc
rear.....11-inch disc
Tires,
front.....Carlisle 3.00x21
rear.....Carlisle 4.00x18
Rim locks, front/rear.....No

WEIGHTS AND CAPACITIES
Weight, wet, unladen.....235 pounds
Fuel capacity.....1-3/4 gal.

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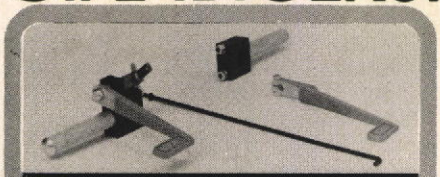

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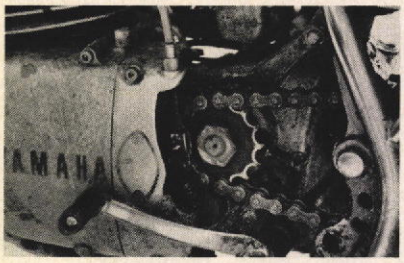
tech tips

AN OUNCE OF PREVENTION

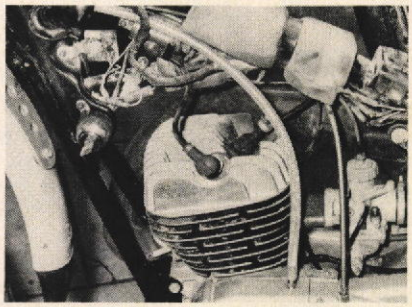
Yamaha waited until their '75 model to admit there was a problem in this area. All their new off-road models have this cut-away case feature. In addition to providing easy access to the engine sprocket this cutaway feature keeps the sprocket area clear of dirt and debris buildup. Another bonus lies in protecting the



transmission case from possible breakage if the chain breaks or jumps the sprocket. There is a case cover supporting screw that passes between the chain runs and invariably gets torn out when a chain failure occurs. Cut the rear of the case away until you leave only the clutch actuating mechanism and the cable sheath anchor point.

A CASE FOR VENTING

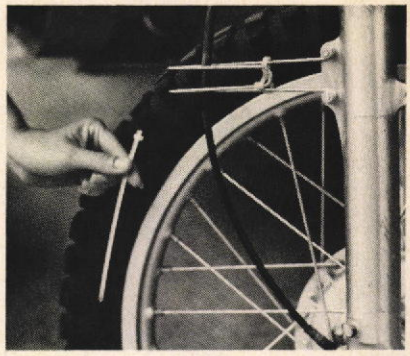
Venting a case is no big thing, and it does eliminate the potential problem of moisture in the magneto housing. Drill a 5/16-inch hole and then tap with a ⅛-inch pipe tap. Careful, that's thin stuff. Install a brass fitting made to accept rubber



or plastic tubing. Reinstall the case and route a short length of tube up under the gas tank and secure it to the frame where it will be protected from water. If you do a lot of dusty riding, slip a small wad of lightly oiled steel wool in the end of the tube as a dust trap.

CABLE PROTECTORS

If your bike has this type of wire bail securing the tach and front brake cables here a neat way to keep the cables from jumping out of their guide in the rough stuff. Weave a



plastic cable tie through the bail in a figure eight and secure at the open end of the guide.

DOUBLE DUTY TIE-DOWNS

Those tie-down straps can be put to work again after you reach your destination and want to set up a comfortable campsite. A piece of tarp, a couple of 2x4's and you're in business.

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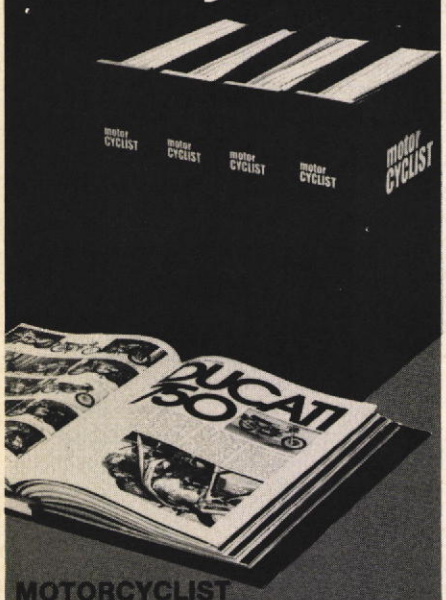

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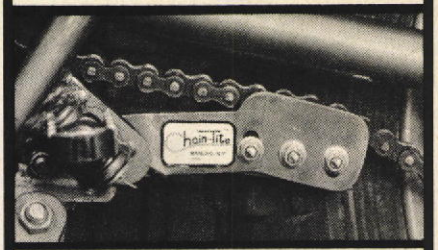

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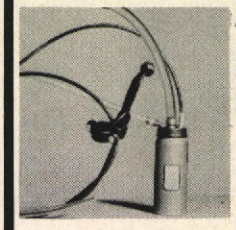

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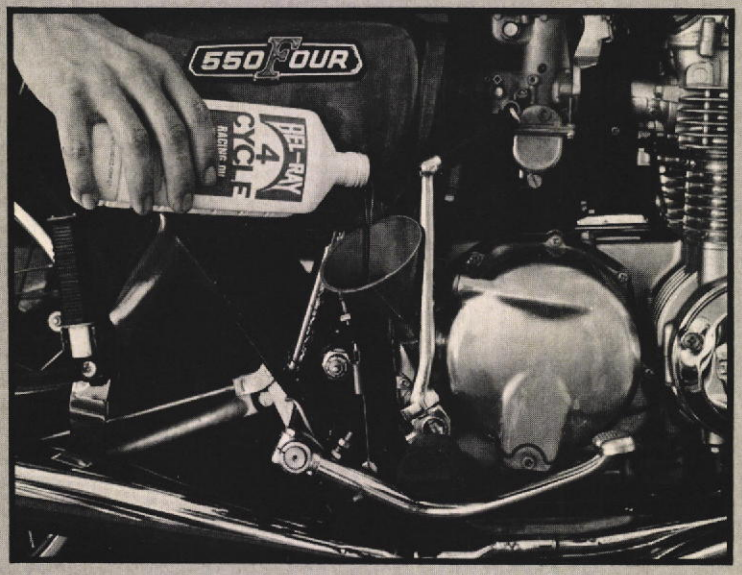

It's no secret that you can squeeze a few more horses out of a stock machine. Many riders bolt-on a few hi-performance goodies or go for a super tune-up to gain that little "extra". Now that you've spent a few hundred, why not spend an extra buck to assure you're getting the maximum out of your oil. Change to Bel-Ray 4-Cycle Racing Lubricant. You'll pay a little more, but then you get a lot more. A lot more performance, a cooler, cleaner running engine, longer engine life and protection against rust and corrosion. **Bel-Ray 4-Cycle Racing Oil** is a hi-performance oil formulated for racing motorcycles. Bel-Ray makes a complete line of motorcycle lubricants for all machines. Sold only at motorcycle dealers. Ask your dealer. If he doesn't have it, write us.

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MONOTRACK MONOCOQUE

continued from page 47

outside diameter, and hence to the largest rotating surface of the pulley. While all this is going on, the spring is keeping a constant, predescribed pressure on the pulleys so that when the power is eased, the pulleys will once again spread apart, all the while keeping the engine revs constant.

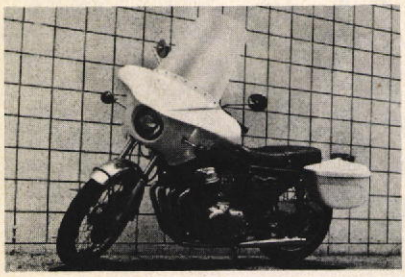
As this special Gates belt is of fixed length, you may ponder as to what happens to the slack. Very simple. The rear section of the converter, the driven half, works quite the same way so that when the forward pulley is forcing the belt to its outer extremities, the rear one is letting the belt slip down to its centerline. It is rather like a motorized derailler system on a bicycle if you can imagine a constant power source on the pedals and the chain slipping from smaller to larger sprockets on the front half with the reverse happening at the rear wheel. A constant power that varies the forward motion of the machine.

The power is then driven to the rear wheel by means of another Gilmer belt that is driven by a sprocket just inboard of the swing-arm mounting point. The actual swing-arm shaft is mounted on four tapered roller bearings with a step in the shaft so that the sprocket can be affixed. The whole drive line is extremely rigid and while many people may question the use of the swing arm pivot shaft as a member of the drive train, Dan has never experienced any problems in this area.

The only area that has caused some concern has been the belt between the two sections of the converter. However, with the new Comet unit and new belts from Gates that employ a process of binding rubber with a super sturdy fiber called Kevlar from Dupont, Dan thinks that his final obstacle is a thing of the past.

While all of the technical bits and pieces are of interest, the real point of Dan's special is that it really works. It is not just a brainchild of a brainy guy. We spent a day on it and the only way to describe it is that it is totally unique. The initial impression is that it is very, very fast and then, just when you think you should be doing something with your hands and feet, you find yourself just hanging on with nothing to do but hold on to the throttle. The machine takes care of the rest of the normal two-wheel chores.

Initially it feels as if a normal clutch is slipping and that you should roll off the throttle but that impression soon fades as you realize you are going well over the ton and there is a corner looming up at you. With the rear brake being controlled by a lever in the normal clutch lever position, it is just a matter of squeezing for all you are



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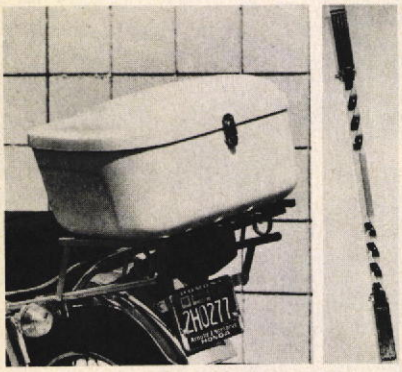

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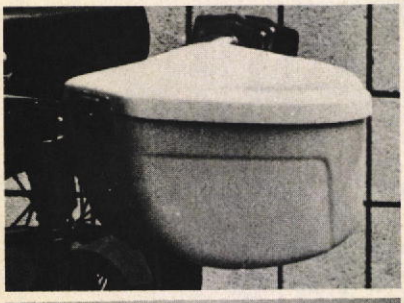
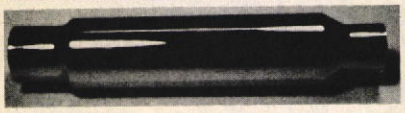
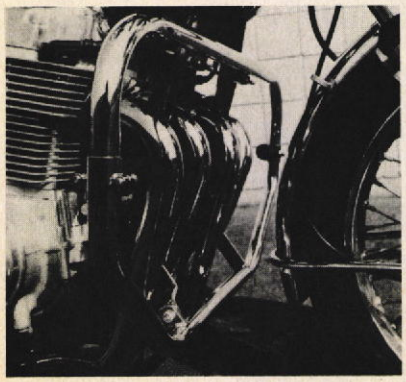




PERFORMANCE



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MONOTRACK MONOCOQUE

continued from page 80

worth with both of your hands. At first it feels as if the bike is never going to stop until you notice that the speed is dropping quickly but the noise isn't. A quick mental flash reminds you that the revs are always constant. It is like pulling the clutch in on a normal bike, keeping the revs near the red line and braking to a halt. Spooky and it takes some getting used to.

We didn't really spend enough time on the bike to assess its handling qualities, mainly because it would take quite some time to familiarize yourself with the power characteristics coming out of the corners. Hannebrink had the converter adjusted so that the drive started coming in at about 5000rpm, leaving about 3500rpm as a power band, but we could never be sure if the drive-line was hooked up or not and couldn't bring ourselves to grab a handful while cranked over. Dan admitted that he also had this problem early on but once he had the feel of the bike, it was no problem. It didn't feel wrong—just alien.

But what does all this sophisticated back-yard wizardry have to do with you? Plenty if Hannebrink pulls off his next project. A high performance, limited quantity, sporting roadster could very well be the next bike to leave the Monotrack headquarters. However, Dan has learned so much on this bike that the 'for-sale' version will have dozens of improvements.

The chassis will be almost identical, although it will be constructed out of aluminum to save cost. Suspension will be along accepted lines with Ceriani on the front and Arnaco on the rear as the probable choices. Wheels will be 18" to ease tire choice problems while the torque converter will be the same but Hannebrink is still undecided about a power plant. As the selling price will have to be high, he doesn't think that an in-line air-cooled three cylinder has enough appeal. He is currently looking into water-cooled twins and threes with the main factor being the availability. Whatever the decision, most of the snowmobile units have gobs of power so that the performance will be quite similar to the bike tested here. Normal lighting systems will be used as well as an electric starter and a well muffled exhaust system.

The outcome could very well be one of the most interesting machines to inhabit the twisty tarmac of backroads across the country. Monotrack hopes to produce 25-50 machines in the first year and while the price will probably make Benelli Six buyers cringe, it would be worth it just to pull up to that Z-1 rider with an automatic, monocoque cafe racer that will blow his mirrors off. •

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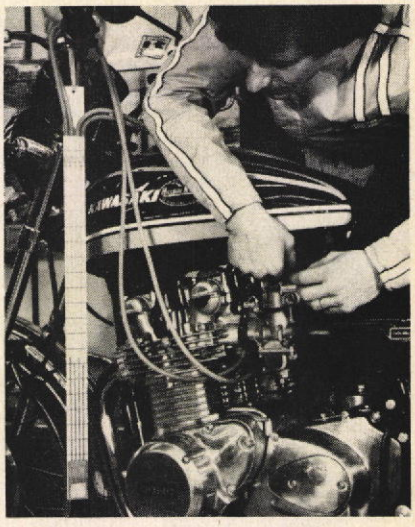

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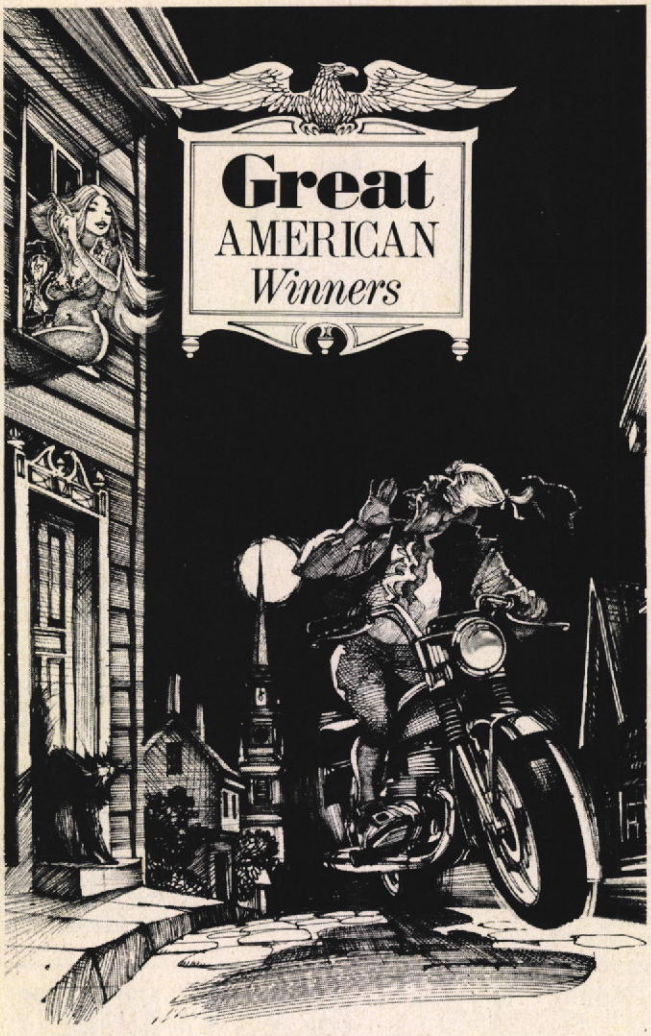

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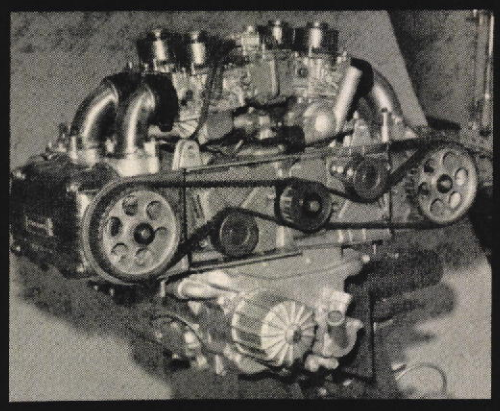

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